16th International Primary Care Diabetes Europe Conference

The new challenges of Primary Care in Diabetes management

15-17 JUNE 2023

BARCELONA

PCDE

primary care diabetes europe

FINAL PROGRAMME & ABSTRACTS BOOK

TABLE OF CONTENTS

Published by:

CONGRESOS Y EDICIONES SEMFYC

Congresos y ediciones semFYC
Carrer del Pi, 11, 2a pl., of. 13
08002 Barcelona (Spain)

ISBN: 978-84-126903-9-2

WELCOME

Dear Colleagues and Friends,

On behalf of the organizing committee of the 16th Primary Care Diabetes Europe Conference, it is my pleasure as Chairman to extend a warm welcome to each and every one of you.

Your presence here is a testament to your commitment and dedication to the field of primary care, in particular in the domain of care for people with diabetes (PWD). Together, we have gathered here to share knowledge, exchange ideas and forge new paths in the ever-evolving landscape of primary diabetes care.

Diabetes, as we all know, has emerged as a global health challenge of immense magnitude. Its prevalence continues to rise and affects millions of individuals globally.

Primary care practitioners bear the responsibility of playing a crucial role in early detection, effective management and comprehensive patient care. Our role extends beyond medical treatment; we are advocates, educators and pillars of support for those living with diabetes.

In this conference, we have assembled an exceptional line-up of experts and thought leaders in the field of diabetes management. Know-how that is relevant for primary care has been shared.

By means of the power of collaboration and shared knowledge, we can enhance our understanding of diabetes and its multifaceted impact on individuals, families and communities.

The theme of this year's conference is "*The new challenges of Primary Care in Diabetes management*".

Over the course of the next two days, we will talk about a number of hot topics, including obesity and diabetes, health inequalities in diabetes, patient-centred care approaches and the digitalization of managing diabetes. In addition, we will explore the critical role of primary care in preventive measures, early intervention and the promotion of healthy lifestyles.

During the PosterWalks, you will have the chance to interact with fellow researchers and experts in the field. The e-poster sessions will showcase a multitude of topics. These interactive sessions, all chaired by renowned opinion leaders, will enable you to engage directly with presenters, ask questions and gain a comprehensive understanding of their work.

I encourage you all to actively participate in the discussions, engage with our speakers and chairs and connect with your peers.

During this conference, the Paul Cromme award will be presented to Professor Dr. David Matthews.

David Matthews is Emeritus Professor of Diabetic Medicine at the University of Oxford and former President of EASD (European Association for the Study of Diabetes).

With thanks for their hard work to the entire organizing team, it is an honour to announce that the EACCME European Accreditation assigned to this conference is up to 5 CME credits.

We are also grateful to our valued sponsors and we can offer you some additional satellite symposia as an extension to the conference.

This conference serves as a platform for the exchange of ideas and the creation of lasting collaborations. It is by means of our collective efforts that we can drive meaningful change and improve the lives of people living with diabetes.

I would like to extend my heartfelt gratitude to the organizing team and scientific committee, whose efforts have made this conference possible. Their commitment has facilitated this gathering and has ensured a promising and enriching experience for all participants.

I welcome you to this Primary Care Diabetes Europe Conference. May the discussions and connections fostered here inspire you and pave the way for a brighter future in diabetes care.

Thank you and I wish you all a truly productive and memorable conference.

Prof. Dr. Xavier Cos
Chairman PCDE

COMMITTEES

ORGANIZING COMMITTEE

Chair

Prof. Dr. Xavier Cos - Chair PCDE (Spain)

Members

- Prof. Dr. Pinar Topsever - Vice Chair PCDE (Turkey)
- Dr. Philippe Domeyer - Executive PCDE Board Member treasurer (Greece)
- Dr. Gerardo Medea - Executive PCDE Board Member (Italy)
- Prof. Dr. Samuel Seidu - Executive PCDE Board Member (UK)
- Prof. Dr. Kamlesh Khunti (UK)
- Dr. Waqas Tahir - Deputy VC of PCDE Education Committee (UK)

SCIENTIFIC COMMITTEE

Chair

Prof. Dr. Pinar Topsever - Vice Chair PCDE (Turkey)

Members

- Prof. Dr. Xavier Cos - Chair PCDE (Spain)
- Prof. Dr. Samuel Seidu - Executive PCDE Board Member (UK)
- Dr. Philippe Domeyer - Executive PCDE Board Member treasurer (Greece)
- Dr. Gerardo Medea - Executive PCDE Board Member (Italy)
- Dr. Martin Hadley-Brown - PCDE Working group member (UK)
- Drs. Guusje Neijens - PCDE Working group member (Netherlands)
- Prof. Dr. Imre Rurik - PCDE Working group member (Hungary)
- Prof. Dr. Johan Wens - PCDE Working group member (Belgium)
- Dr. Ana Cebrián - PCDE Working group member (Spain)

HOST ORGANIZING COMMITTEE

Chair

Prof. Dr. Xavier Cos - Chair PCDE (Spain)

PCDE EXECUTIVE BOARD MEMBERS

- Chair: Prof. Dr. Xavier Cos Claramunt
- Vice chair: Prof. Dr. Pinar Topsever
- Executive Board Member Treasurer: Dr. Philippe Domeyer
- Executive Board Member - Research: Prof. Dr. Samuel Seidu
- Executive Board Member: Dr. Gerardo Medea

Working Group Members:

- Prof. Dr. Johan Wens
- Dr. Martin Hadley-Brown
- Drs. Guusje Neijens
- Prof. Dr. Imre Rurik
- Dr. Ana Cebrián
- Dr. Stefan Jansson

PCDE Operational Manager

Mrs. Ottilia Hoogeslag (Netherlands)

Contact: secretary@pcdeurope.org

More information is available on our websites

- PCDE website: https://www.pcdeurope.org/
- PCDE Conference site: http://www.pcdeconference.org/
- Primary Care Diabetes Journal: https://www.primary-care-diabetes.com/
- The online manuscript submission site for the journal is live at: https://www.editorialmanager.com/pcd/default2.aspx

CME ACCREDITATION

European accreditation

The **16th International Primary Care Diabetes Europe Conference, Barcelona** has been granted 5 European CME credits (ECMEC®s) by the European Accreditation Council for Continuing Medical Education (EACCME®).

Accreditation Statement

The **16th International Primary Care Diabetes Europe Conference, Barcelona, Spain, 15/06/2023 - 17/06/2023** has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) with **5 European CME** credits (ECMEC®s). Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity.

Through an agreement between the Union Européenne des Médecins Spécialistes and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of *AMA PRA Category 1 Credits*™. Information on the process to convert EACCME® credit to AMA credit can be found at www.ama-assn.org/education/earn-credit-participation-international-activities.

Live educational activities, occurring outside of Canada, recognised by the UEMS-EACCME® for ECMEC®s are deemed to be Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

EACCME® credits

Each participant can only receive the number of credits he/she is entitled to according to his/her actual participation at the event once he/she has completed the feedback form.

Please find below the breakdown of ECMEC®s per day:

16.06.2023 – 4.00

17.06.2023 – 1.00

The EACCME® awards ECMEC®s on the basis of 1 ECMEC® for one hour of CME with a maximum of 8 ECMEC®s per day.

Spanish accreditation

Consell Català de Formació Continuada Professions Sanitàries

Comisión de Formación Continuada SISTEMA NACIONAL DE SALUD

The **16th International Primary Care Diabetes Europe Conference** has been accredited by the Catalan Board for the Ongoing Training of Healthcare Professions (CCFCPS) with **0.8 credits (6.50 hours)**.

A minimum of 80% attendance to the entire conference will be required to obtain the CFC credits and the certificate.

DAILY PLANNER

THURSDAY, 15 JUNE 2023

TIME	PLENARY MEETING ROOM (7+8)	MEETING ROOM (5+6)
17:00 - 17:30	Opening ceremony & Welcome reception	
18:00 - 19:30		Workshop. The development of local PCDE branches in European countries: why, what, how

FRIDAY, 16 JUNE 2023

TIME	PLENARY MEETING ROOM (7+8)	MEETING ROOM (5+6)
8:00 - 9:00		Breakfast Industrial Satellite Symposium
9:00 - 9:15	Opening of the scientific programme	
9:15 - 10:00	**Session 1.** Diabetes in the young and elderly	
10:00 - 10:40	**Session 2.** Oral presentation of best abstracts	
10:45 - 11:30		Coffee break and poster walk
11:30 - 12:20	**Session 3.** Obesity and diabetes. Latest state of evidence	
12:20 - 13:00	**Session 4.** Paul Cromme lecture. Lifetime achievement award	
13:00 - 14:30	Lunch	Lunch Industrial Satellite Symposium
14:30 - 15:30	**Session 5.** Keynote lecture. Dual agonists, new horizons in incretin therapies	
15:30 - 16:30	**Session 6.** EUDF – PCDE sessions	
16:30 - 17:00	**Session 7.** Top 5 in diabetes (best 5 papers of the year in PCD Journal)	
17:30 - 19:00		Afternoon Industrial Satellite Symposium

SATURDAY, 17 JUNE 2023

TIME	PLENARY MEETING ROOM (7+8)	MEETING ROOM (5+6)
8:00 - 9:15		Breakfast Industrial Satellite Symposium
9:30 - 10:15	**Session 8.** Rising star lecture	
10:15 - 11:00	**Session 9**. Social determinants of health – Health inequalities in diabetes post COVID-19 pandemic	
11:00 - 11:45		Coffee break and poster walk
11:45 - 12:45	**Session 10.** Cardio reno-metabolic discourse – CKD in Primary Care	
12:45 - 13:00	Closing ceremony	
13:00	Informal drink and *tapas*	

PCDE SCIENTIFIC CONFERENCE PROGRAMME

PCDE has been organising conferences, either joint meetings with partner organisations or standalone conferences since 1999 which have established themselves as the largest international conference on diabetes in primary care. The scientific programme, apart from keynote lectures and state-of-the-art sessions from international experts, offers highlights such as the "Paul Cromme Lecture", where an eminent European figure or organisation, active in primary care and diabetes is recognised for his or her achievement and the "Rising Star Lecture", where a junior researcher whose scientific work significantly contributes to evidence-based primary care for diabetes will be given the opportunity to present their research findings and will be acknowledged for his or her work.

One of the highlights of the scientific programme not to be missed is the poster sessions where authors of accepted abstracts will have the opportunity to present and share their experience and research results during interactive poster sessions chaired by leading diabetes experts in the primary care field. Poster walks are lively scientific sessions where junior researchers are given the opportunity to network with colleagues as well as leading researchers and eminent scientists chairing the event. Poster sessions are organised as e-sessions where the posters will be available throughout the conference in the poster hall on display as well as after the event on the conference website's e-poster gallery. The highest scored abstracts have been selected for oral presentation during a plenary session.

The abstracts accepted without presentation will also be available as electronic posters on display in the poster hall as well as after the conference on the e-poster gallery on the conference website.

SCIENTIFIC PROGRAMME

THURSDAY, 15 JUNE 2023

16:00 – 17:00 Registration

17:00 – 17:30 Opening ceremony & Welcome reception - *Xavier Cos & Pinar Topsever*

18:00 - 19:30 Workshop. The Development of local PCDE branches in European countries: why, what, how - *Geert Goderis*

FRIDAY, 16 JUNE 2023

08:00 – 09:00 Breakfast Industrial Satellite Symposium

09:00 – 09:15 Opening of the scientific programme - *Xavier Cos*

09:15 – 10:00 **Session 1.** Diabetes in the young and elderly
Chair: *Xavier Cos*
- T2DM in the young - *Melanie Davies* (UK)
- T2DM in the elderly - ***Guy Rutten*** (Netherlands)

10:00 – 10:40 **Session 2.** Oral presentations of best abstracts
Chair: *Philippe Domeyer*

10:45 – 11:30 Coffee break and poster walk
Poster walk chairs: *David Matthews & Michael Nauck*

11:30 – 12:20 **Session 3.** Obesity and diabetes. Latest state of evidence
Chair: *Sam Seidu*
- Is obesity the "new diabetes"? - *Gabriel Cuatrecasas* (Spain)
- Treat to prevent obesity or diabetes? - *Volkan Demirhan Yumuk* (Turkey)

12:20 – 13:00 **Session 4.** Paul Cromme lecture. Lifetime achievement award
Chair: *Xavier Cos*
- Confronting the strange pandemic of type 2 diabetes – *David Matthews* (UK)

13:00 – 14:30 Lunch/Lunch industrial Satellite Symposium

14:30 – 15:30 **Session 5.** Keynote lecture. Dual agonists, new horizons in incretin therapies - *Michael Nauck* (Germany)
Chair: *Pinar Topsever*

15:30 – 16:30 **Session 6.** EUDF – PCDE sessions
Chair: *Xavier Cos*
- Introducing EUDF – PCDE cooperation – *Chantal Mathieu* (Belgium)
- The promise of digital tools in diabetes - *Philippe Domeyer* (Greece)
- Five priorities for advancing integrated care - *Pinar Topsever* (Turkey)
- Diabetes registries; enabling high quality diabetes care - *Manel Mata* (Spain)

16:30 – 17:00 **Session 7.** Top 5 in diabetes (Best 5 papers of the year in PCD Journal) – *Manel Mata* (Spain)
Chair: *Banshi Saboo & Pinar Topsever*

17:30 – 19:00 Afternoon Industrial Satellite Symposium

SATURDAY, 17 JUNE 2023

08:00 – 09:15 Breakfast Industrial Satellite Symposium

09:30 – 10:15 **Session 8.** Rising Star Lecture

Chairs: *Pinar Topsever & Waqas Tahir*

- Epidemiology of hypoglycaemia: Trends, risk factors and outcomes - *Francesco Zaccardi* (UK)

10:15 – 11:00 **Session 9.** Social determinants of health – Health inequalities un diabetes post COVID19 pandemic

Chair: *Sam Seidu*

- Diabetes in ethnic minority popularions – *Kamlesh Khunti* (UK)
- Increased diabetes burden due to the pandemic hegemony in health care – *Kamlesh Khunti* (UK)

11:00 – 11:45 Coffee break and poster walk

Poster walk chairs: *Waqas Tahir & Kamlesh Khunti*

11:45 – 12:45 **Session 10.** Cardio reno-metabolic – CKD in Primary Care

Chair: *Kamlesh Khunti*

- The kidney and diabetes: the Primary Care approach - *Per-Henrik Groop* (Finland)
- The heart and diabetes - *Francesco Cosentino* (Sweden)

12:45 – 13:00 Closing ceremony

13:00 Informal drink and *tapas*

LECTURE SUMMARIES

THURSDAY, 15 JUNE 2023

WORKSHOP

Time: 18:00 - 19:30 / Meeting Room (5+6)

The development of local PCDE branches in European countries: why, what, how.

Agenda

- "Why". Challenges in the field of Primary Care diabetes and the importance of setting up country based PCDE branches - *Xavier Cos*
- "What". What are the focus and the fields of interest of this country based PCDE branches? - *Geert Goderis*
- RedGDPS. The Spanish experience - *Xavier Cos*
- PCDS. The British experience - *Waqas Tahir*
- Group discussion. What is your meaning about the development of country based PCDE branches?
- Wrap up. Summary of the group discussions
- How to proceed to further develop country based PCDE branches?

FRIDAY, 16 JUNE 2023

SESSION 1. DIABETES IN THE YOUNG AND ELDERLY

Time 09:15 - 10:00 / Plenary Meeting Room (7+8)

Type 2 diabetes mellitus in the young

Speaker

Melanie Davies is a Professor of Diabetes Medicine at the University of Leicester and an Honorary Consultant Diabetologist at the University Hospitals of Leicester NHS Trust. She is the Co-Director of the Leicester Diabetes Centre, University Hospitals of Leicester NHS Trust.

Professor Davies' research interests include the causes, screening, prevention, self-management, and treatment of type 2 diabetes mellitus. She is a National Institute for Health Research Senior Investigator Emeritus and Director of the NIHR Leicester Biomedical Research Centre and co-chair of EASD/ADA's Consensus Report on T2DM Management.

Professor Davies has published over 700 original articles and has over £60M of grant funding. She was awarded the CBE (Commander of the Most Excellent Order of the British Empire) in the 2016 New Year's Honour's List for services to diabetes research.

Summary

Learning outcomes

- Understand the impact of early onset type 2 diabetes.
- Consider the multimorbidity associated with early onset T2DM.
- Consider treatment options of early onset T2DM.

Learning objectives

- To explore features and characteristics of early onset T2DM.
- To look at evidence base for management strategies.
- To consider research gaps.

Type 2 diabetes mellitus in the elderly

Speaker

Guy Rutten was a Professor of Diabetology in Primary Care (1998-2018) and the Director of the training course for executives in Diabetology in Primary Care at University Medical Center Utrecht.

His research activities focus on person-centred diabetes care, screening for diabetes, T2DM and cardiovascular disease and diabetes primary care. He is the (co-)author of more than 400 original articles in (inter)national peer-reviewed journals and he supervised 14 RCTs on type 2 diabetes. Additionally, he wrote several books on type 2 diabetes and general practice topics as well.

He is a principal investigator of the ADDITION study and was a member of the writing committee of the NAVIGATOR study and a member of the global expert panel of the LEADER trial.

He chaired the Dutch General Practice Advisory Group for more than 20 years and was the founder of the EASD Primary Care Study Group from 2006 to 2011. From 2004-2010 he was a member of the scientific Advisory Board of the Dutch Diabetes Research Foundation. He was the first editor-in-chief of the journal Primary Care Diabetes until it was indexed in Medline in 2008.

In 1989-1990 he was the Head of the Guideline Development Department of the Dutch College of General Practitioners.

From 1982-2014 he worked as a general practitioner in his group practice.

In 2005 he received the biennial prize for the highest impact article in Medisch Contact, a weekly journal for Dutch health care professionals.

In 2017 he was appointed a Member of Merits by the Dutch College of General Practitioners and in 2018 he received the royal award 'Knight in the Order of the Dutch Lion'.

Summary

Many more "old and very old" people with T2DM will be treated in primary care in the forthcoming years for several reasons. However, it is difficult to generalise the gap between calendar age and biological age. That's why diabetes management in older adults requires a regular assessment of medical, psychological, functional, and social domains. Based on such an assessment, the ADA framework for considering treatment goals could be applied. Suggested treatment goals should be discussed with the patient and/or their relatives, resulting in person-centred diabetes care and shared decision making. Physicians should

realise that the pathophysiology of T2DM in the elderly involves age-related loss of beta-cell function and that trial data to underpin treatment for older people with T2DM are lacking to a large extent. Furthermore, many trials that did include older adults excluded those with comorbidities, people with polypharmacy or those with cognitive impairment. Thus, the ones who are left in the trials are not the ones we see in our practice.

Having set goals together, the possible side effects of medications and the complexity and costs of the regimen are issues to be resolved. Unintended consequences of strict glycaemic control in older adults include hypoglycaemia, difficulty of coping with the treatment, increased caregiver burden, loss of independence, and increased financial burden. Diabetes overtreatment is a frequent and major issue in older people with type 2 diabetes that should be avoided.

In older adults medication classes with a low risk of hypoglycaemia are preferred; however, in developing treatment plans costs of care should be considered in order to reduce risk of cost-related nonadherence.

Learning outcomes

- Comorbidities and polypharmacy are highly prevalent in older people with T2DM.
- Many large-scale RCTs do not include older people with T2DM and comorbidities
- A framework that primary care physicians could use for setting targets is at hand.

Learning objectives

- To help primary care physicians treat older patients with T2DM in the best possible way.

SESSION 2. ORAL PRESENTATION OF BEST ABSTRACTS

Time 09:15 - 10:00 / Plenary Meeting Room (7+8)

The best abstracts selected from the abstracts accepted by the Conference's Scientific Committee will be presented orally in this session:

- Are current vitamin-B12 deficiency screening recommendations for people with type 2 diabetes (T2DM) adequate?
- DiabeText, an mHealth intervention to support diabetes self-management, improves quality of life and diabetes self-efficacy in people with type 2 diabetes
- Covid-19 Pandemic and Diabetes - Pandemic Effects on Blood Glucose Regulation
- Health literacy and adherence to therapy in type 2 diabetes: a cross-sectional study in Portugal

Please see complete abstracts on page 26

SESSION 3. OBESITY AND DIABETES. LATEST STATE OF EVIDENCE

Time 11:30 - 12:20 / Plenary meeting Room (7+8)

Is obesity the new diabetes?

Speaker

Gabriel Cuatrecasas has worked as a Family Physician since 2005 in the EAP Sarrià Primary Care Center in Barcelona and in the Diabetology and Nutrition Service

group CPEN (Sagrada Familia and Quirón-Teknon Hospitals) Barcelona. His is also an Associate Professor in Family Medicine at the International University of Catalonia (UIC). His main areas of interest focus on Type 2 Diabetes and Obesity management in Primary Care. He has collaborated on advisory boards, publications in diabetology, RCT and the design of type 2 Diabetes route for the Department of Health - Generalitat de Catalunya in 2021. He is the coordinator of the Obesity Working Group at the Spanish Society of Family Medicine (SEMFYC) and at the Catalan Society of Family Medicine (CAMFIC). He has been also a member of the Endocrinology Group AIS-BCN Barcelona Esquerre (CatSalut – Hospital Clínic Barcelona) since 2017, as well as the redGDPS and GEDAPS group, SEEDO, SED and EASD.

Summary

Obesity is a serious, chronic, and relapsing disease that stands out for its high prevalence and unfortunately suffers a clear upward trend worldwide. It generates a great impact on morbidity, mortality, quality of life and health costs. Moreover, there is a difficulty in adequately attending obesity that is partly due to a biased perception by patients and health professionals. Scientific knowledge has evolved substantially, and we started to have drugs with a real impact in terms of efficacy and safety. Because it shares many pathways with type 2 diabetes, the time has come to reformulate a new understanding of both diseases.

Learning outcomes

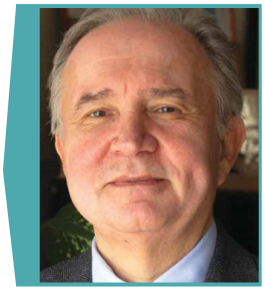
- Be able to provide the bases for an adequate approach to obesity.
- Design interdisciplinary interventions in obesity.
- Know the basic therapeutic management both dietary and pharmacological.

Learning objectives

- To understand why obesity is important to be considered a chronic adiposity-based disease.
- To unveil comorbidities beyond type 2 diabetes.
- To understand which subgroups are at higher risk and clinical relevance.

Treat to prevent obesity or diabetes?

Speaker



Professor *Volkan Demirhan Yumuk* graduated from Hacettepe University Medical School in Ankara. After completing his residency in internal medicine, he became a research fellow at the University of Michigan School of Medicine division of endocrinology in 1993. In 1997 he completed a clinical endocrinology fellowship program at the University of Alabama School of Medicine. Currently he is working at the Cerrahpasa Medical Faculty in the Endocrinology, Metabolism & Diabetes Division as a full professor. He is a founding member and the current president of Turkish Association for the Study of Obesity; he is currently serving as president elect for the European Association for the Study of Obesity (EASO). He is a SCOPE Fellow, an EASO-European Fellow in obesity management, and a member of the editorial board for Obesity Facts. Dr Yumuk is an active fellow of the American College of Endocrinology and the American College of Physicians. He is a member of the Focus Area Expert Panel on Diabetes, Obesity, Metabolism and Nutrition and a member of the Research Roadmap Steering Group of the European Society of Endocrinology, a member of the Obesity Canada CALIBRE scientific planning committee, a member of the AACE Obesity Algorithm Task Force, a member of the MENA Working Group for World Obesity Federation and a member of the Policy Working Group of EASO. Dr Yumuk's research area is management of obesity and type 2 diabetes. He has published numerous papers in national and international journals, and authored chapters in books in the field of endocrinology. He is also a reviewer for several journals including Obesity, Obesity Facts, Obesity Reviews, Clinical Obesity, International Journal of Obesity, Obesity Research and Clinical Practice, European Journal of Internal Medicine, and Journal of Endocrinology.

Summary

Obesity is multifactorial progressive, relapsing chronic disease. Moving further on, it is a non-communicable disease and should be treated as such. Obesity is a gateway disease to other morbidities related with cardiometabolic, mental and mechanic origins. Obesity management is not only weight loss but maintaining the lost weight by preventing weight regain in order to result in sustainable health gains. Preventing or treating obesity would prevent or treat type 2 diabetes and its complications. The algorithm for treatment of type 2 diabetes should be primarily based on obesity management by all modalities within a multidisciplinary approach. The choice of antidiabetic medications that may cause weight loss or are weight neutral are crucial.

Learning outcomes

- Understand that obesity is chronic disease similar to type 2 diabetes
- Explore the outcomes of weight loss trials

Learning objectives

- Awareness of the global syndemic of obesity and type 2 diabetes
- Position multidisciplinary obesity management in type 2 diabetes treatment algorithms

SESSION 4. PAUL CROMME LECTURE. LIFETIME ACHIEVEMENT AWARD

Time 12:20 - 13:00 / Plenary Meeting Room (7+8)

Confronting the strange pandemic of type 2 diabetes

Speaker

David Matthews is Emeritus Professor of Diabetic Medicine at the University of Oxford. He has wide experience in clinical medicine, teaching, and research. He was the Founding Chairman of the Oxford Centre for Diabetes, Endocrinology and Metabolism, having fundraised for its construction and set up its research and teaching infrastructure.

He has taught medicine, statistics, research processes and administration both at established UK and international venues and online. He established the annual residential Robert Turner Course in research training in Oxford. He was elected an NIHR senior fellow. He gave the Diabetes UK Banting lecture in 2010.

He founded the Oxford Health Alliance which continues to give grants to elected 'Tseu Fellows' from lower middle-income countries.

He has 360 peer-reviewed papers; a recent citation count was >91,000, H index 92. He was a member of the UKPDS steering committee, Co-chair of the CANVAS trial. He is currently Chair of the steering group of VERIFY and a member of the board of the FOCUS study. He has particular interests in the world epidemic of non-communicable disease (NCD).

He is past President of the European Association for the Study of Diabetes of which is now an Honorary Fellow and recipient of the Albert Renold Medal. He is currently the Chair of the Trustees of the Oxford Hospitals Charity.

Summary

We are currently facing a global pandemic of obesity and Type 2 diabetes. In some settings, the population prevalence of Type 2 diabetes is 50%, and half of those affected will die from diabetes-related complications. Eight centuries ago, an epidemic of bubonic plague swept across Europe, killing at least half of its victims. This was termed by some as 'The Black Death'. Drawing analogies between this Black Death of the 14th century and the modern-day pandemic of Type 2 diabetes one can view both diseases

in terms of aetiological agents, reservoirs, vectors and predisposing toxic environments; populations can be considered as highly susceptible to the 'transmissible' agents of Type 2 diabetes. These are calorie excess, inadequate food labelling, poorly regulated advertising, cynically engineered social peer pressure for calorie consumption, poor town planning, and encouragement of sedentary lifestyles. Many aspects of modern life are detrimental to health, and these may not be simply the result of individual choice or personal 'fault' in what has now become a widespread toxic environment.

In tackling a pandemic of a contagious microbial pathogen, breaking the cycle of transmission is paramount. In the diabetes epidemic the improvement of the environment is also paramount; this can only be achieved by political will and prompt, decisive legislation backed by science and the medical community. Far from fearing that such measures edge us towards a 'nanny state', the public should expect responsible governments and health-care providers to safeguard them from the toxic milieu that puts them at risk of obesity and its complications – including diabetes. Communities and populations have the right to have their health protected.

Professor Matthews will address the issues of the 'NCD* mindset', genetic excuses, the laissez faire attitude of governments, the problem of the power of commercial interests, and the difficulties involved in community intervention studies. He will outline some ideas and views on the way ahead.

SESSION 5. KEYNOTE LECTURE. DUAL AGONISTS, NEW HORIZONS IN INCRETIN THERAPIES

Time 14:30 - 15:30 / Plenary Meeting Room (7+8)

Speaker

Michael Nauck is the Head of Clinical Research at the Diabetes Division of St. Josef-Hospital (Ruhr-University Bochum) in Bochum, Germany.

Professor Nauck has a particular research interest in the role of gastrointestinal peptide hormones (incretins: glucose-dependent insulinotropic polypeptide, GIP, and glucagon-like peptide-1, GLP-1) in the physiological regulation of metabolism and in the pathophysiology of type 2 diabetes. He has contributed pivotal studies proving a therapeutic potential of GLP-1 in type 2 diabetes. He has contributed to the development of incretin-based glucose-lowering medications such as GLP-1 receptor agonists and inhibitors of dipeptidyl peptidase-4. Additional areas of interest include spontaneous hypoglycaemia (insulinomas), pancreas transplantation, cardiovascular complications of type 2 diabetes, and the modification of cardiovascular risk in type 2-diabetic patients with glucose-lowering pharmacotherapy. His scientific contributions have been honoured with several awards, including the Ferdinand-Bertram Award (1993), the Werner-Creutzfeldt Award (2007) and the Paul Langerhans Medal (2012) from the German Diabetes Association, and the Claude Bernard Medal from the European Association for the Study of Diabetes (2022).

He has served as reviewer for all major diabetes journals and has published more than 245 original articles and 130 reviews and book chapters. His publications have been quoted > 84,000 times, his "H-index" is 108, and he has been a "highly cited researcher" (among the top 1 %) in 2019 (Web of Knowledge). Professor Nauck is a member of a number of professional societies, including the German, European, and American Diabetes Associations, and the International Diabetes Federation.

Summary

Obesity and diabetes have reached a high prevalence. In recent years, progress has been made through the discovery of a new class of medicines: the gut-hormone co-agonists. These novel therapeutics combine action on GLP-1 plus other gut hormone receptors within a single molecule, thereby augmenting metabolic benefits. The first of these engineered unimolecular compounds exerted balanced co-agonism at glucagon like-1 (GLP-1) and glucagon receptors, reported in 2009. Other co-agonists under development include dual GLP-1/gastric inhibitory peptide (GIP) co-agonists, first described in 2013, and triple GLP-1/ GIP/ glucagon co-agonists, initially designed in 2015. In 2022, a GIP/GLP-1 co-agonist named Tirzepatide has been approved for the treatment of type 2 diabetes, providing superior HbA1c target achievement compared to basal insulin or selective GLP-1 RA treatment and unprecedented average weight loss (up to 22.5% in non-diabetic, obese subjects). It is the purpose of this talk to summarize the discovery, development, and mechanism of action of these gut hormone co-agonists, and to discuss potential challenges, limitations, and future developments.

Learning outcomes

- Understanding the difference between various co-agonists depending on the receptors addressed by a given molecule.
- Demonstrating the augmented effectiveness on glycaemic control and body weight versus selective GLP-1 receptor agonists.

Learning objectives

- To provide information on the rationale for the development of multihormone co-agonists.
- To show the similarity in mechanisms of action of co-agonists with multiple gut hormones determining diabetes control and weight loss after bariatric surgery.

SESSION 6. EUDF - PCDE SESSIONS

Time 15:30 - 16:30 / Plenary Meeting Room (7+8)

Introducing EUDF-PCDE cooperation

Speaker

Chantal Mathieu is a physician-scientist who has contributed to the field of diabetes and endocrinology through basic and clinical research. Her basic research work focuses on the pathogenesis and prevention of type 1 diabetes. Prof. Mathieu's clinical work involving new products and treatment paradigms in diabetes, such as new insulins, adjunct therapies and diagnosis of gestational diabetes have made her a speaker in international fora. Prof. Mathieu coordinates the European project 'INNODIA' on biomarker discovery and intervention studies in type 1 diabetes. Prof. Mathieu is president of EASD and vice-president of the European Diabetes Forum.

Summary

The European Diabetes Forum (EUDF) has been founded to bring together multiple stakeholders from across the diabetes landscape in Europe in order to present a united voice on the needs of the diabetes community to governments, regulators, payers, and others. The EUDF established three Strategic Forums with 45 expert representatives from among our partners. These Strategic Forums worked in depth on concrete recommendations and solutions for existing long-standing challenges and issues in diabetes care related to 3 strategic priorities:

- People with diabetes: Technology, digitalization, and empowerment of self-care
- Data and registries for better outcomes for people with diabetes
- Diabetes and the healthcare system: primary care and integrated care

Spearheading these solutions in digitalization and self-care, registries, and integrated care will promote a more data-driven and person-centric approach to healthcare and diabetes management that should pay off in terms of fewer complications, improved quality of life and more efficient use of clinical resources.

The EUDF will continue to serve as an expert partner to promote these efforts, acting as a forum for a collaborative campaign for policy change. Our vision is to enable healthcare systems to cope with the diabetes pandemic, while achieving the best possible outcomes for people with diabetes.

Learning outcomes

- The EUDF brings together multiple stakeholders from across the diabetes landscape to present a united voice on the needs of the diabetes community to decision- and policymakers.

- The EUDF's recommendations pinpoint three areas where - if certain steps are taken – progress is readily within reach: integrated care, registries, and digital technologies.
- Local action is needed to implement the European recommendations at the country level.

Learning objectives

- To understand the need to work together across specialties and sectors to optimize the outcomes for people with diabetes.
- To understand we already have proven strategies and tools at our disposal that can turn the tide on the diabetes epidemic, if only we can generate the political and social will to deploy them.
- To understand approaches to set-up data registries, to optimize integrated care and adopt and scale-up digital solutions.

The promise of digital tools in diabetes

Speaker

Philippe-Richard J. Domeyer is a General Practitioner and Biostatistician with Special Interest in Diabetes. He has been an Academic Tutor at the Hellenic Open University since 2013, is the Treasurer of Primary Care Diabetes Europe (PCDE), a founding President of Primary Care Diabetes Greece (PCDG) and a National Representative of Greece at the European General Practice Research Network.

Philippe is the Principal Investigator in a PCDE-funded European Research Project entitled "Quality assessment of type 2 diabetes care in Greece: setting indicators from a primary care perspective". He has published research output pertaining to diabetes and cardiometabolic diseases in peer-reviewed international journals and presentations at international and national Conferences. Philippe is a member of the expert panel of the European Diabetes Forum (EUDF) Strategic Forum 'Self Care, Technology & Digitalisation', where he represents primary care and PCDE, and co-authored "The Promise of Digital Tools: A roadmap for apps", a document and series of recommendations compiled by the same expert panel. As a founding President of PCDG, he is involved in various national educational and research activities in the diabetes field. He is also the founding scientific co-director of the international postgraduate 'Diabetes and Obesity Training Programme' delivered by Miguel-Hernandez University of Spain and the Metropolitan College of Greece.

Summary

The number of people living with diabetes has multiplied during the last decades, thus putting pressure on health systems and national economies. To address this global health challenge, the development of innovative solutions has become an imperative need and digital health tools will be an integral part of such solutions.

Especially in the post COVID19 era, digital health tools are becoming increasingly important in the daily clinical care of patients with diabetes. These tools can support primary care professionals in their work through enhanced training, regular patient contacts and ongoing information sharing regarding the prevention of complications or treatment adaptations. To realize the potential of mobile apps, two conditions must be in place: apps must be easily available and accessible to people with diabetes and HCPs, and they should meet high standards of effectiveness and quality.

The integration of medical apps into diabetes care poses many challenges. There are many new apps on the marketplace, but regulations and policy solutions must catch up to keep pace with the new technology. Countries are only now beginning to establish further procedures that enable reviewing, monitoring, and integrating medical apps better into clinical pathways.

Learning outcomes

- Understand the importance of digital health tools in diabetes.
- Explore the pathways and challenges of the integration of medical apps into diabetes care.

Learning objectives

- To discuss the landmark of digital health tools in diabetes.
- To discuss the potential of mobile apps and conditions to be met for their successful introduction into clinical practice.

Five priorities for advancing integrated care

Speaker

Dr *Pinar Topsever* is a Professor of Family Medicine and the chair of the department of Family Medicine at Acıbadem Mehmet Ali Aydınlar University School of Medicine in Istanbul, Turkey, where she is involved in undergraduate and postgraduate teaching and training. She is a member of several professional and scientific organisations including TAHUD, TAHEV, WONCA, EGPRN, PCDE and EASD. Prof. Topsever has served terms in the executive committees of two former EASD study groups (Study Group on Hypertension in Diabetes (HID) between 2003-2007; PCDE Study Group since 2005). She regularly presents the results of her research at scientific conferences and publishes them in peer-reviewed journals. Dr Topsever has been a member of PCDE (Primary Care Diabetes Europe) since 2005. She was elected the PCDE executive board member in charge of research in 2010 and was re-elected in 2014 when she became EB member in charge of education, coordinating PCDE's educational activities (e.g., scientific conferences, CME programs). In March 2016, Dr Topsever was elected PCDE Vice-Chair (General Secretary). She was re-elected for a second term of 4 years in this position in 2021.

She acted as scientific Secretary and/or local organiser of major conferences such as all PCDE scientific conferences since 2010, the WONCA Europe Istanbul Regional Conference (2008) and the EGPRN conferences in Antalya (2008) and Kuşadası (2013).

Dr Topsever has been involved in the curriculum development and implementation of the in-service retraining of family doctors within the Turkish primary health care reform programme entitled "Transition in Health" organised by the Ministry of Health, as well as evidence-based guideline development for primary care. She is also involved in several national and international academic CME activities (especially about primary care management of PWD) for PCPs. Her fields of interest are care for PWD in primary care, epidemiology in the context of health promotion and preventive care, evidence-based medicine, and research methodology. Professor Topsever is an editorial board member of peer-reviewed scientific journals, a referee in a number of scientific awards committees and has served as a clinical referee-reviewer for organisations including the Cochrane Collaboration and EASD e-Learning as well as several peer-reviewed scientific journals.

Summary

Integrated care is an emergent set of practices that seeks to move away from care that is fragmented, episodic, and service-based, with care that is continuous, coordinated, and outcomes-focused. As the WHO describes it, integrated care is "seamless, smooth, and easy to navigate".

For people with diabetes, the practical implications of integration are not theoretical, but fundamental to how people access and navigate the health system. Diabetes is a lifelong disease, with daily challenges requiring lifestyle adjustments and consistent engagement with therapies and technologies, a burden that can have significant physical and psychological repercussions if not properly managed. Greater integration of care therefore promotes a long-term and more holistic focus towards people with diabetes that is well suited to the complexity of the disease. Integration is about improving outcomes and improving the quality of life for people with diabetes, two aspects that are interrelated. Nonetheless, the immensity of the topic often leads to a sense of paralysis and an uncertainty about where to begin. To make advances in integrated care, prioritisation is needed The European Diabetes Forum, a group consisting of healthcare professions, researchers, industry representatives, and people with diabetes, have put forward five priorities to make progress in integration. These are pragmatic strategies to improve integration in all care settings, including implementing assessment models, developing patient centred pathways for diabetes care, revamping educational curricula, and putting incentives in place to encourage cooperation and teamwork within and between primary and secondary care settings. Integration is a process more than an

end state. In the diverse countries of Europe, there is no magic formula for integration. What is important is to apply a general set of principles, analytical perspectives, and tools that over time will lead to long-term shifts in the way people experience care, and the way care is provided.

Diabetes registries; enabling high quality diabetes care

Speaker

Dr *Manel Mata-Cases* is a Family and Community Medicine specialist and has been working as a general practitioner in "La Mina" Primary Health Care Centre, Barcelona (Spain) since 1984.

He holds a PhD in Translational Medicine. His doctoral thesis was entitled "Evolution of type 2 Diabetes care in Catalonia 1993-2013" (University of Barcelona, 2017).

Dr Mata was one of the founders of the GEDAPS "Primary Care Diabetes Study Group" in 1992 of which he was chairman from 2009 to 2013. Moreover, he is a part time researcher in the Barcelona Ciutat Research Support Unit of the Foundation University Institute for Primary Health Care Research Jordi Gol i Gurina (IDIAPJGol) and the Centre of Investigation of Diabetes and Associated Metabolic Diseases (CIBERDEM), Barcelona, Spain where he is a member of the Primary Care Research Group on Diabetes (DAP.cat group).

Since 1993, he has participated in several guidelines and consensus documents on the management and treatment of type 2 Diabetes Mellitus (T2DM) in Spain. He is one of the authors of the Spanish "2014, 2017 and 2020 RedGDPS algorithm for the Management of T2DM in Primary Care", the "2012 Institut Català de la Salut T2DM Guidelines" the 2013 and 2017 "Catalonian Public Health Service Harmonization of T2DM Guidelines", the 2018 Spanish Diabetes Society T2DM Guidelines, and the 2021 and 2022 PCDE Position Statement on the pharmacological management of Type 2 Diabetes in Primary Care.

His main areas of research are epidemiology, pharmacological treatment, therapeutic inertia, health costs, and trends in the T2DM quality of care, through analysis of the SIDIAP population database in Catalonia (Spain).

He has written more than one hundred original articles on diabetes in national and international peer reviewed journals, has been reviewer of manuscripts for several scientific journals, and lectures widely on topics related to type 2 diabetes, mainly in terms of its pharmacological treatment, therapeutic inertia, and costs.

Summary

Diabetes is one of the greatest health challenges Europe faces at present. All major diabetes stakeholders in Europe now come together in the EUDF to generate policy recommendations and ideas for policy implementation. Diabetes registries are essential to enable a more evidence-based and data-driven approach to diabetes management.

The diabetes community in Europe has launched several programmes and actions over the last decades, including the St Vincent Declaration, with the aim of improving the outcomes of care. These were ambitious projects with challenging treatment goals. Unfortunately, these initiatives resulted in incremental improvements that were far less than required or hoped for. In most countries the outcomes of care could not be monitored because of the absence of quality registries. At present, most data on diabetes in Europe are estimated, rather than robust, except for a few countries and regions. These registries could provide us with valuable scientific data but often are not sufficiently applied to measurably improve diabetes care.

Registries may ensure quality control and better adherence to guidelines, track performance across clinics or regions and help identify the reasons for variation in outcomes, and inform the delivery of care and treatments, which can reduce costly complications. One of the key lessons learned is that it takes more than just a registry to improve care, we need to use data to raise awareness and initiate action to improve outcomes for people living with diabetes. First, there needs to be the recognition by healthcare decision makers that changes are essential. Second, a dedicated team needs the authority to initiate the development of a local/regional data registry and lead and manage this registry with the mandate to drive change where needed to improve the well-defined and agreed upon outcomes of care. Third, following a successful regional effort, we need the roll-out of a broader European registry.

Learning outcomes

- Reveal the need to have data on clinical performance and health outcomes as an essential part of Diabetes programs.
- Emphasize the need to have continual sources of information at regional, national, and European level in order to improve the quality of care.

Learning objectives

- To discuss the relevance of having data on clinical performance and health outcomes and how to collect them.
- To review results of indicator trends of diabetes care based on registry data.
- To review possible barriers to the implementation of national registries.

SESSION 7. TOP 5 IN DIABETES (BEST 5 PAPERS OF THE YEAR IN PCD JOURNAL)

↘ **Time 16:30 - 17:00 / Plenary Meeting Room (7+8)**

Speaker

Manel Mata-Cases (see on page 20)

Summary

Primary Care Diabetes is the official journal of Primary Care Diabetes Europe. The journal publishes original research articles and high-quality reviews in the fields of clinical care, diabetes education, nutrition, health services, psychosocial research and epidemiology, and other areas relevant for diabetology in a primary-care setting. The purpose of the journal is to encourage interdisciplinary research and discussion between all those who are involved in primary diabetes care on an international level with the final aim of improving the care for people with diabetes mellitus within the primary-care setting. During 2022, 12 reviews and 128 original research papers were published. In this lecture we are going to review the 5 most relevant.

Learning outcomes

- Highlight the most relevant papers of the PCD Journal in 2022.
- Increase the knowledge and spread of the scientific value of the journal.

Learning objectives

- To review the best five papers of last year in PCD journal.
- To discuss the contributions of each paper to the knowledge on each topic.

SESSION 8. RISING STAR LECTURE

Time 09:30 - 10:15 / Plenary Meeting Room (7+8)

Epidemiology of hypoglycaemia: Trends, risk factors and outcomes

Speaker

Francesco Zaccardi is Associate Professor in Clinical Epidemiology and Health Data Science and Deputy Director of the Leicester Real World Evidence Unit, Diabetes Research Centre, University of Leicester.

After completing his residency in Internal Medicine and Diabetes at the Catholic University School of Medicine in Rome, he has been Visiting Researcher at the Cardiovascular Epidemiology Unit, University of Cambridge, and at the Institute of Public Health and Clinical Nutrition, University of Eastern Finland. Between 2014 and 2022 he has been Clinical Research Fellow and Senior Clinical Research Fellow at the Diabetes Research Centre, University of Leicester, where he completed his PhD in epidemiology of hypoglycaemia in 2018 and MSc in Medical Statistics (simulations in multistate models) in 2022.

His main interests are epidemiology of cardiometabolic diseases, comparative assessment of glucose-lowering drugs, and statistical modelling.

Summary

Hypoglycaemia is a common complication in individuals with diabetes. In this lecture, I will summarise the current evidence on the association between hypoglycaemia and health-related outcomes and present the results of several analyses investigating the changing epidemiology of hypoglycaemia based on all hospital records in England. These findings are complemented with the results of network meta-analysis models, where the risk of hypoglycaemia has been compared across trials with newer glucose-lowering medications.

SESSION 9. SOCIAL DETERMINANTS OF HEALTH – HEALTH INEQUALITIES IN DIABETES POST COVID19 PANDEMIC

Time 10:15 - 11:00 / Plenary Meeting Room (7+8)

Diabetes in ethnic minority populations

Speaker

Kamlesh Khunti is a Professor of Primary Care Diabetes and Vascular Medicine at the University of Leicester, UK. He is the Co-Director of the Leicester Diabetes Centre and leads a research group that is currently working on the early identification of, and interventions with, people who have cardiometabolic disease or are at increased risk of developing cardiometabolic diseases. His work has influenced national and international guidelines on the screening and management of people with diabetes. He has led a programme of work during the COVID19 pandemic and is a member of Scientific Advisory Group for Emergencies (SAGE) and Chair of the SAGE Ethnicity Sub-panel. Professor Khunti is also the Director of the UK National Institute for Health Research (NIHR) in Applied Research Collaborations (ARC) East Midlands, the Director

of Centre for the Centre for Ethnic Health Research, the Director of The Real World Evidence Unit and the Director of the NIHR Global Research Centre for Multiple Long Term Conditions.

He is an Emeritus NIHR Senior Investigator and Principal Investigator on several major national and international studies. He has published over 1200 peer-reviewed articles. Professor Khunti is a Fellow of the Academy of Medical Sciences and is currently an advisor to the Department of Health, a Member of the International KDIGO on diabetes and CKD, a Member of the American Diabetes Association Standards of Care 2023 and a Clinical Advisor for the National Institute for Health and Care Excellence (NICE). He is the Chair of the American Diabetes Association Therapeutic Inertia Initiative, and the Chair of the National Diabetes Audit Research Group. He is a Past Chair of the Department of Health–RCGP Committee on Classification of Diabetes and is a Past Chair of the NICE Guidelines on Prevention of Diabetes. He is also an Honorary Visiting Professorial Fellow with the Department of General Practice, University of Melbourne.

He has won numerous awards nationally and internationally, including 'Sardar Vallabhbhai Patel Award for Excellence in Medical Research, India' and the 'Primary Care Diabetes Society Lifetime Achievement Award'. He was awarded the CBE in the 2022 New Year's Honour's List for services to health. He has been cited as the top researcher globally by publication by Expertscape.

Summary

- Type 2 diabetes affects ethnic minorities disproportionately occurring at a younger age and at a higher prevalence.
- The prevalence and incidence of certain complications such as cardiovascular disease are higher in ethnic minority populations.
- There are large variations in care for people from ethnic minority populations.
- We need to improve wider determinant of health in people from ethnic minority populations.

Increased diabetes burden due to the pandemic hegemony in health care

Speaker

Kamlesh Khunti (see on page 22)

Summary

- Public health crisis such as COVID19 pandemic poses both direct and indirect risks to people with chronic diseases such as diabetes due to disruptions in care.
- Globally, diabetes has also been shown to be the most disrupted chronic condition during the pandemic.
- Disruptions have had a major impact on risk factor control and increased mortality.
- It is therefore imperative that people with diabetes are prioritised during the recovery phase for routine care including risk factor assessment and management.

SESSION 10. CARDIO RENO-METABOLIC DISCOURSE – CKD IN PRIMARY CARE

↘ **Time 11:45 - 12:45 / Plenary Meeting Room (7+8)**

The kidney and diabetes: the Primary Care approach

Speaker

Professor *Per-Henrik Groop*, MD, DMSc, FRCPE graduated from the University of Helsinki in 1982. It was here where he defended his thesis on 'The relationship

between GIP and beta-cell function in man' in 1989. Following post-doctoral studies at Guy's Hospital, University of London, under Professor Giancarlo Viberti, Professor Groop returned to Helsinki as Consultant of Nephrology. He served as Professor of Nephrology (Chair) 2010-2015 and is currently Professor of Internal Medicine (Chair) at the University of Helsinki. He is also Chief Physician at the Department of Nephrology, University of Helsinki and Helsinki University Hospital and Principal Investigator of the Finnish Diabetic Nephropathy (FinnDiane) Study at the Folkhälsan Research Center in Helsinki, Finland. He is Adjunct Professor at the Department of Diabetes, Monash University, Melbourne, Australia.

His research is focused on the dissection of the pathogenesis of diabetic complications with special emphasis on diabetic nephropathy. In order to provide a unique set of clinical resources with high power to identify genes and genetic variants associated with diabetic complications, Professor Groop initiated the large, nationwide FinnDiane Study in 1997. To date, this landmark study comprises 9000 patients with Type 1 Diabetes and their family members recruited via a comprehensive network of 92 hospitals and healthcare centres throughout Finland. His FinnDiane Research Group represents an inter-disciplinary team of 45 scientists, post-graduate students and personnel.

Professor Groop served as Associate Editor of Diabetologia, 2005–2007, and as member of the Advisory Board, 2008–2011. He was Associate Editor of Kidney International and International Diabetes Monitor, 2007–2011. He is currently on the Editorial Board of Diabetes Care. He was Chairman of the EASD Scientist Training Course, 2007–2013, President of the European Diabetic Nephropathy Study Group (EDNSG), 2008–2010, and Honorary Secretary of the EASD 2013-2016. He is since 2011 the chairman of the Signe and Ane Gyllenberg Foundation. He was awarded the prestigious EASD Castelli Pedroli Prize – 24th Camillo Golgi Lecture in 2009, the Novo Nordisk Foundation Lecture in 2012, and the IDF Award for Clinical and Therapeutic Research 2019.

Professor Groop has published more than 450 peer-reviewed original articles in high-impact journals, 38 reviews and book chapters, 50 papers in his native languages Swedish and Finnish as well as more than 700 abstracts presented at major international meetings.

Summary

Diabetes is increasing with epidemic proportions, from 30 million people affected by diabetes in 1985 to 537 million in 2021. Screening individuals with diabetes for the presence of chronic kidney disease (CKD) by urinary albumin excretion rate (i.e., albuminuria) and estimated glomerular filtration rate (eGFR) shows that CKD is common and is detected in more than every second individual screened. Early detection of CKD is important, because CKD increases the risk of early death, cardiovascular events like myocardial infarction and stroke, hospitalization for heart failure, and need for kidney replacement therapy (dialysis, transplantation). It goes without saying that detection of CKD is not only a test result it is a "call for action". Optimal standard of care ("five-finger-rule") and additional novel organ-protective medications have shown dramatic improvements in the prognosis of individuals with CKD and diabetes. Since most individuals with diabetes are seen by primary care physicians, it is important that screening for early signs of CKD and immediate initiation of optimal standard of care and organ-protective medication is the responsibility of the primary care physician. This presentation will focus on the prevalence and consequences of CKD in diabetes as well as how the risk of complications can be reduced in individuals with CKD and diabetes.

Learning objectives:

- How should I screen for the presence of CKD in diabetes?
- What is optimal standard of care – "five-finger-rule"?
- How can I improve the prognosis of individuals with CKD and diabetes by prescribing the novel organ-protective medications?

The heart and diabetes

Speaker

Professor *Francesco Cosentino* is a professor of Cardiology and the chair of Cardiovascular Medicine at the Karolinska Institute and Karolinska University Hospital in Stockholm, Sweden.

He obtained his MD degree and postgraduate training in Internal Medicine and

Cardiovascular Disease at the University of Rome, Italy. In 1991 he moved to the Mayo Clinic & Foundation, Rochester, MN, USA, for a Cardiovascular Fellowship. During his stay at the Mayo Clinic & Foundation he fulfilled all the requirements for a PhD in Biomedical Sciences - Cardiovascular Pharmacology. In 1995, he joined the Cardiovascular Division at the University Hospital of Bern, Switzerland. Two years later, Prof. Cosentino moved to the Division of Cardiology at the Zurich University Hospital as a "lecturer" and then a "titular professor" of Cardiology. In 2006, he was appointed an associate professor of Cardiology at the University "Sapienza" of Rome. Since 2013, he has been full professor of Cardiology at the Karolinska Institutet and Karolinska University Hospital in Stockholm.

Prof. Cosentino is the recipient of grants and prizes from national and international institutions, research councils, and private foundations. He is the leading author of more than 250 original articles published in top-ranking, peer-reviewed journals. Prof. Cosentino is a member of the European Society of Cardiology Board and the chair of ESC Advocacy Committee. He is the Deputy Editor of the European Heart Journal and a Consulting Editor of the Cardiovascular Research Journal. He was the chairman of the 2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular disease and in 2020-2022 he was the vice president of the European Society of Cardiology. Currently, he chairs the ESC Advocacy Committee and ESC board member.

Summary

The cardiovascular disease continuum begins with risk factors such as diabetes mellitus, progresses to vascular disease and myocardial dysfunction, and finally ends with cardiovascular death. Patients with type 2 diabetes (T2D) are at a high risk for heart failure (HF). Moreover, HF patients with T2D have a worse prognosis than those without. The lifetime adjusted cumulative hazard for incident HF in patients with T2D, hypertension, and obesity with an index age of 55 years reaches 60%. Moreover, patients with T2D represent a substantial proportion of patients hospitalized for HF. In a large global registry, patients with a history of atherothrombosis and T2DM had a 30% greater risk of hospitalization for HF (HHF) than patients with atherothrombosis but without T2D.

Results from clinical outcome trials with glucose-lowering therapies have yielded mixed results with regard to effects on HF risk, with some increasing, many neutral, and some decreasing risk. Six clinical outcome trials with 4 different sodium-glucose co-transporter 2 (SGLT2) inhibitors in patients with T2DM (EMPA-REG OUTCOME, CANVAS Programme [two trials], DECLARE-TIMI, CREDENCE, VERTIS CV) have demonstrated consistent reduction in the risk for first HHF (with hazard ratios (HRs) ranging from 0.61 to 0.73 in the overall population) across a range of patients with and without atherosclerotic cardiovascular disease, as well as in populations with T2D with moderate or worse chronic kidney disease (CREDENCE and SCORED) or with and without diabetes (DAPA-CKD and EMPA KIDNEY).

In these patients at high risk for HF, a consistent risk reduction of CV death or HF hospitalization was observed. Accordingly, the American Diabetes Association, the European Society of Cardiology with the European Association for the Study of Diabetes, and the American Heart Association recommend the use of SGLT2 inhibitors in patients with T2D to reduce the risk of HHF events.

ABSTRACTS

ORAL PRESENTATIONS

SESSION 2: ORAL PRESENTATIONS OF BEST ABSTRACTS
Friday, 16 June 10.00-10.40 h
Plenary Meeting Room (7+8)

Are current vitamin-B12 deficiency screening recommendations for people with type 2 diabetes (T2DM) adequate?

Sumandeep Bains[1], Mona Sidhu[1], Alex Bird[1], Monzoor Quader[2], Rajeev Raghavan[2]
[1]The Royal Wolverhampton NHS Trust; [2]New Cross Hospital

Aim(s) or purpose: Recent MHRA guidance suggests people with T2DM managed with metformin should undergo vitamin-B12 testing if they have macrocytosis or vitamin-B12 deficiency symptoms, and periodic monitoring for patients at-risk of deficiency. Similar recommendations are present globally. However, deficiency symptoms and the term "periodic monitoring" are non-specific. This project aimed to evaluate the prevalence of vitamin-B12 deficiency and macrocytosis amongst people with T2DM in a real-life general practice setting, and review applicability of the new MHRA guidance.

Design and method: This retrospective review was conducted in people with T2DM managed with and without metformin (preceding 5-year window) and non-T2DM people, with risk-factor exclusions (Crohn's, Coeliac or previous gastrectomy), in a GP practice that includes vitamin-B12 testing in their T2DM annual review. Vitamin-B12 deficiency prevalence (absolute if B12<187nmol/L, indeterminate if B12 187-300nmol/L) was calculated, along with macrocytosis presence (MCV>100FL) at time of deficiency for T2DM sub-groups taking metformin (T2MFG) and not taking metformin (T2NMFG) and for non-T2DM people.

Results: Patients with and without T2DM had mean ages of 65 and 46 years, respectively. Given this population's young average age of non-T2DM people, the absolute vitamin-B12 deficiency prevalence of 6% (248/4276) in non-T2DM is in-line with published NICE deficiency values for this age group. Similarly, amongst T2NMFG, the absolute deficiency prevalence of 16% (16/98) is in-line with NICE values for this group's average age. In contrast, despite exclusions, T2MFG had a higher-than-expected absolute deficiency prevalence of 29% (129/445) compared to the age-comparable background population prevalence. Only 0-6% of deficient patients across the practice population had macrocytosis.

Conclusions: These results make a case to ideally include vitamin-B12 deficiency screening in the annual review of T2DM people taking metformin, rather than relying on risk factors, a raised MCV or symptoms-based screening. Some risk factors, e.g., PPI use, were not excluded, but such factors are common, making it difficult to practically apply a risk-stratified approach. Cost-effectiveness analysis of such screening is required.

COVID19 pandemic and diabetes - pandemic effects on blood glucose regulation

Feyzanur Erdem[1], Muhammed Tunc[2], Aslihan Turkmen[3]
[1] Prof. Dr. Cemil Tascioglu State Hospital, [2] Bezmialem University, Eyup Campus, [3] Gaziosmanpasa Plevne Family Medicine Health Care Center

Aim(s) or purpose: In this study we aimed to investigate the effects of the COVID19 pandemic, which occasionally causes lockdown and partial quarantine implementations, on blood glucose regulation in patients with Type 2 diabetes mellitus (DM).

Design and method: Study Design: Single-center, retrospective, observational study. Methods: The laboratory findings of type 2 DM patients who had been followed-up by our clinic for at least 2 years before the pandemic and who also came for a control after the 3-month nationwide lockdown in Turkey (June 2020). Data were obtained from the hospital information system and examined. The values before the pandemic and after the lockdown were compared.

Results: The study included a total of 169 patients. Of the participants 49.7% were female and 50.3% were male. The mean age was 57.7 years in female patients and 54.8 years in male patients. The triglyceride level was significantly increased after the lockdown compared to before the pandemic in all patients ($p<0.005$). The levels of fasting blood glucose (FBG) and glycated haemoglobin (HbA1c) were significantly lower after the lockdown in the patients aged over 65 years, while these values were increased in the other age group, but the difference was not statistically significant.

Conclusions: The COVID19 pandemic led to a statistically insignificant disruption in glucose regulation especially in young type 2 DM patients, while glucose regulation improved in the elderly population under quarantine conditions. Our study was conducted over a short term and with a limited population and therefore further studies with larger populations are needed.

DiabeText, an mHealth intervention to support diabetes self-management, improves quality of life and diabetes self-efficacy in people with type 2 diabetes

Rocío Zamanillo[1,2], Maria Antonia Fiol[1,2], Sofía Mira[1,2], Escarlata Angullo[2], Joana Maria Taltavull[1,2], Ignacio Ricci[1,2,3]

[1] Research Group on Primary Care and Promotion of the Balearic Islands Community (GRAPP-caIB), Health Research Institute of the Balearic Islands (IdISBa) (Spain); [2] Primary Care Research Unit of Mallorca, Balearic Islands Health Service (Spain); [3] CIBER de Epidemiología y Salud Pública (CIBEResp) (Spain)

Aim(s) or purpose: To evaluate the effectiveness of DiabeText, a low intensity, multifaceted, mobile health (mHealth) intervention to support medication adherence and lifestyle change targeted to people with type 2 diabetes (T2D).

Design and method: Phase III, 12-month, two-arm (1:1 allocation ratio), randomized parallel-group trial. We recruited 742 adults with poorly controlled T2D (glycated hemoglobin (HbA1c) >8% (>64 mmol/mol)) and with at least one prescription of a non-insulin antidiabetic drug. They were allocated to a control (usual care) group or an intervention (DiabeText) group. The primary outcome measures were HbA1c and medication possession ratio (MPR) at the 12-month follow-up visit. Secondary outcomes included adherence to a Mediterranean diet (MEDAS), level of physical activity (IPAQ), quality of life (EQ5D5L), diabetes self-efficacy (DSES), and self-reported adherence to the medication plan (7-item ad hoc questionnaire).

Results: There were no significant differences between groups in sociodemographic and clinical characteristics at the baseline. At the 12-month follow-up, 674 participants completed the study (retention rate = 90.8%). There was a significant drop in HbA1c (control, 8.4% to 7.6%; DiabeText, 8.3% to 7.6%; $p<0.001$) and MPR (control, 86.9% to 84.1%; DiabeText 86.8% to 84.4%; $p<0.05$) in both groups after follow-up, with no between-group differences observed. The DiabeText intervention was associated with improvements in self-reported medication adherence (OR = 1.37; 95% CI 0.99 to 1.89; $p = 0.051$), and in mean scores of diabetes self-efficacy (control, 7.7; DiabeText 8.3; $p<0.001$) and quality of life (control, 0.93; DiabeText 0.95; $p = 0.005$). The potential impact of DiabeText on changes in lifestyle behaviors is currently being examined and the results may be presented during the Conference.

Conclusions: DiabeText may offer a low-cost and highly scalable strategy to improve diabetes self-efficacy and quality of life for people with T2D. More development work and research are needed to enhance its impact on glycemic control and medication adherence.

Health literacy and adherence to therapy in type 2 diabetes: a cross-sectional study in Portugal

Simone Rodrigues[1], Inês Rosendo[2], Luiz Santiago[2], Flávia Fernandes[3]

[1] Unidade de Saúde Familiar Dr. Pelaez Carones, ACeS Braga (Portugal), [2] Faculdade de Medicina da Universidade de Coimbra, [3] IPO Porto

Aim(s) or purpose: Therapy adherence is a key factor in the control of type 2 diabetes mellitus (T2DM). Optimal selfcare requires skills including health literacy (HL). The objective of this research was to analyse the relationship between HL and adherence to T2DM.

Design and method: Multicentre, cross-sectional study in Portuguese Primary Care. A sociodemographic questionnaire and two validated instruments – Medical Term Recognition Test and Summary of Diabetes Self-care Activities – were applied. The last value of HbA1c and the number of chronic medications were collected from clinical records. Descriptive statistics and bivariate correlations were performed. Multivariable linear regression was performed to assess the association between HL and adherence to therapy while controlling for potential confounders.

Results: Participants (n = 354) were on average 63.67 ± 10.39 years old, 57.1% males, 68.4% with inadequate HL and an average HbA1c of 7.03 ± 1.18% (53 mmol/mol). Better HL was correlated with higher adherence to the total of self-care activities (ρ = 0.136; p = 0.021), non-pharmacological therapy (ρ = 0.142; p = 0.009), and foot care (ρ = 0.168; p = 0.002). In multivariable linear regression analyses, better HL (β = 0.176, p = 0.003), less than minimum wage (β = -0.197, p = 0.001), and insulin therapy (β = 0.272, p = 0.001) were independently associated with increased adherence to overall self-care activities.

Conclusions: In an approximately representative sample of people with type 2 diabetes in Portugal, HL was a key factor for greater adherence to self-care activities with diabetes, regardless of salary and insulin therapy and thus should be considered in the design of strategies to overcome nonadherence among patients with type 2 diabetes.

POSTERS

Albuminuria screening in the Zemun Primary Health Care Center, Belgrade, Serbia - preliminary results

Marija Glavinic Mijic[1]

[1] Primary Health Care Center Zemun, Belgrad (Serbia)

Aim(s) or purpose: To assess the prevalence of albuminuria in the diabetic population in the Diabetes Care Unit of the Zemun Primary Health Care Center in Belgrade, Serbia, and to establish and evaluate the clinical path for diagnosing diabetic kidney disease (DKD) in stage II.

Design and method: A cross-sectional study was conducted in August 2022 and in February and March 2023. A total of 227 visitors to the Diabetic Care Unit in the Zemun PHC were included in the screening. The inclusion criteria were: type 2 diabetes, regardless of the duration of the disease, or type 1 diabetes with a disease duration longer than five years, and eGFR rate greater than 60 ml/min/1.73m2. We carried out the selection of the participants during the consultation. The nephrologist in the regional hospital evaluated the presence or absence of DKD.

Results: A total of 227 patients were invited to testing, and 204 (89.9%) of them responded. Among the participants, 110 (53.9%) were male, and 94 (46.1%) were female. 7 (3.4%) participants had type 1 diabetes, while 197 (96.6%) respondents had type 2. The total number of positive tests was 136 (66.7%) and negative 68 (33.3%). Among persons with type 1 diabetes, 4 (57.1%) were positive, and among type 2 participants, 132 were positive (67.0%).

Conclusions: The prevalence of the positive results in the screened population was high, with more than half positive samples. The high number of respondents may suggest that such screening could be

well-accepted among patients in primary health care. Considering the fact that this test is not on the reimbursement list for GPs in Serbia, this could be the first step to further research and actions to change the standard practice.

A mixed methods investigation of the barriers and facilitators of diabetes medication adherence across different health literacy levels

Yen-Ming Huang[1], Olayinka Shiyanbola[2], Kristen Pecanac[2]

[1] South Dakota State University, [2] University of Wisconsin-Madison

Aim(s) or purpose: (1) To examine whether the barriers and facilitators associated with medication adherence differ among people with T2D across different levels of health literacy. (2) To explore patients' perceptions of the barriers and facilitators of medication adherence across different levels of health literacy. (3) To understand how the qualitative interview data complement the quantitative survey results about the barriers and facilitators of medication adherence.

Design and method: This mixed-methods study used an explanatory sequential design, including a quantitative study with a survey questionnaire followed by a qualitative study with semi-structured interviews. The Health Literacy Pathway Model was used to identify the psychosocial and communication factors that may influence medication adherence. Participants enrolled were at least 20 years old, diagnosed with T2D, understood English, and prescribed at least one oral diabetes medicine daily. Analysis of covariance and direct content analysis were used respectively in quantitative and qualitative analysis. A joint display was used to present the integrated findings from quantitative and qualitative data.

Results: In the quantitative phase, 205 participants provided complete information in the survey questionnaire. In the qualitative phase, 23 participants completed semi-structured interviews. Confirmed by quantitative and qualitative data, holding stronger self-efficacy, having fewer concern beliefs about medication, and possessing fewer perceived barriers to medication-taking are necessary for better medication adherence. Linking medication-taking to a daily routine and focusing on the internal locus of control is an imperative approach to foster self-efficacy of medication use. Addressing patients' life experience and clarifying medication misinformation may help participants cope with their concerns with medications. Solving the high cost of medications and therapy-related problems could lessen participants' perception of barriers to medication-taking.

Conclusions: To optimally support patients' diabetes care, practitioners should address concern beliefs among non-adherent patients with low health literacy, as well as emphasize self-efficacy and perceived barriers to medication adherence among all non-adherent patients with T2D.

A review of guideline recommendations for managing CV risk in patients with prediabetes and diabetes

Li Li[1], Magdy Abdelhamid[2], Michael Blaha[3], Augusto Cobo[4], Francesca Santilli[5], Zhongwei Shi[6]

[1] Bayer AG, [2] Cairo University, [3] Johns Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease, [4] Sanatorio Finochietto, [5] Department of Medicine & Aging and Center for Advanced Studies and Technology, University of Chieti, [6] Ruijin Hospital, Shanghai Jiao Tong University School of Medicine

Aim(s) or purpose: The cardiovascular (CV) risk continuum illustrates the progression of atherosclerosis, allowing for the classification of an intermediate group of patients with advanced subclinical atherosclerosis at high risk of CV events. This commonly includes patients with prediabetes and diabetes mellitus (DM), who have a high morbidity and mortality associated with CV disease. Even though effective therapies such as low dose aspirin are available, guidelines on their use in this patient group remain unclear. A review of commonly used guidelines was conducted to analyse the differences.

Design and method: Nine guidelines (cardiology and/or endocrinology) commonly used in daily clinical practice in the European, North American, Latin American, Asia-Pacific, and Middle Eastern regions were compared with regards to their recommendations for risk assessment, stratification, and the use of low dose aspirin in patients with DM. The inclusion of specific considerations for prediabetic patients was also assessed.

Results: Risk assessment and stratification methods vary across all nine guidelines. Only two guidelines include considerations for patients with prediabetes. Reference to formal risk calculations is made in five guidelines; the other four classify patients simply into either primary or secondary prevention, not highlighting an intermediate population. Guidelines specific to the treatment of patients with DM do not make recommendations for the use of low dose aspirin to reduce CV risk.

Conclusions: Guidelines for the management of elevated CV risk in patients with DM vary. Uniformity among recommendations with regard to accurate risk stratification and the use of low dose aspirin to manage the elevated CV risk among patients with DM may reduce morbidity and mortality rates in this patient group.

Adaptation of a circuit for diabetic retinopathy and glaucoma screening during COVID19

Esther Sancho[1], Adriana Conde[1], Ricardo Carbonell[1], Ramón Sagarra[1], Flavia Sanz[1], Eugenia López[1]

[1] Sant Pere Health Center

Aim(s) or purpose: SARS-COV-2 can be transmitted by aerosols or small respiratory droplets from the conjunctiva. During the incubation period, the infected patient can remain asymptomatic and still be contagious. Due to its high transmission rate, it is necessary to keep a safe distance to reduce the risk of contagion, which can be difficult in some exploratory ophthalmologic procedures.

Patients that are referred to the Non-Mydriatic Retinal Camera (CRNM) for Diabetic Retinopathy (DR) and glaucoma screening, as well as the professionals, are vulnerable during these procedures.

Due to the pandemic, screenings were cancelled for four months which generated a setback for scheduling appointments and a lack of detection and early treatment of this medical condition.

For this reason, it was necessary to adapt the protocol of the circuit to prevent possible contagion, both for patients and professionals.

Design and method: A review of the bibliography published to date and the recommendations agreed upon by different national scientific ophthalmological societies.

Presentation of the CRNM functionality document to the Primary Care Directorate (DAP) for review and approval, which detailed protection mechanisms towards the patient, both in the waiting room and within the CRNM consultation, and defined the precautions for health professional, without forgetting general recommendations for cleaning the space and material.

Results: Until the approval of the Basic Prevention Unit, the measurement of intraocular pressure with an air tonometer was not restarted because it generated aerosols.

In cases where the intraocular pressure measurement could not be delayed, the patients were referred to the hospital for measurement with a Goldmann-type tonometer or with i-Care.

Finally, medical consultation was performed through an online platform between the ophthalmologist and the Primary Care doctor.

Conclusions: Following the approval of the circuit functionality proposal by the DAP, the unit restarted its activity on July 13, 2020, ensuring the continuity of the screening and follow-up of DR in diabetic patients in our territory.

Antidiabetic treatment of patients with type 2 diabetes mellitus (T2DM) and obesity

Carlos Gómez[1], Mercè Villaró[2], Rosa Madridejos[2], Ferran Flor[1]

[1] Consorci Sanitari Integral, [2] Mútua de Terrassa

Aim(s) or purpose: To analyze the antidiabetic treatment of T2DM patients with respect to the degree of obesity.

Design and method: A descriptive, multicenter cross-sectional study was conducted in five primary care centers established in two main urban areas in the province of Barcelona (total population: 148,255). The prevalence of T2DM was 8.9%.

37.01% of patients were categorized as Obese (grade I: 24.9%; grade II: 8.46%; and grade III: 3.65%).

71% of diabetic patients were under pharmacological treatment.

Data was obtained via the electronic medical records and electronic prescriptions of patients over the age of 15 diagnosed with T2DM (ICD-10) from 2018 to 2019. The statistical analysis was performed using EPIDAT and G-STAT statistical packages.

Results: 75.6% of T2DM patients with obesity and 69% of patients with normal weight were treated with antidiabetic drugs.

In comparison with non-obese individuals, obese patients had higher prescription rates of SGLT2 inhibitors (8.66% vs 5.96%; $p<0.001$), GLP-1 analogues (7.38% vs 1.26%; $p<0.001$), and metformin (82.2% vs 78.6%; $p<0.001$), and less use of insulin (24.48% vs 27.45%; $p<0.001$). The remainder of the therapeutic classes showed similar prescription rates.

According to Degrees of Obesity:

	Obesity grade I (%)	Obesity grade II (%)	Obesity grade III (%)
Metformin	82.7	83	77
Sulfonylureas	19.8	17.2	14.3
Glinides	3.6	2.5	2.9
Pioglitazone	1.2	2.6	2.6
iDPP-4	34.6	27.6	25.4
iSGLT2	7.2	11.6	12
aGLP-1	4.4	9.7	23.1
Insulin	24.4	25.1	23.4

Conclusions: T2DM patients with obesity have a greater pharmacological burden compared to antidiabetic treatment in comparison with non-obese patients.

The aGLP1 and iSGLT2 should be the preferred choice in patients with obesity. The group of patients who have severe obesity are the ones that benefit the most from these pharmacological groups. However, for patients with mild and moderate obesity, the prescription of aGLP1 and iSGLT2 is much lower. Therefore, most obese patients do not benefit from antidiabetic medications that decrease weight.

Are people with Diabetes more prone to Tuberculosis? A case-controlled study

Ayse Eylul Donmez[1], Furkan Karabulut[1], Irem Boztepe[1], Melisa Ulufi[1], Sabahattin Erisen[1], Sesin and Pinar Kocagoz[1]

[1] Acibadem Mehmet Ali Aydınlar University School of Medicine

Aim(s) or purpose: Recent studies claim that diabetes has a role in the propensity to infections like Tuberculosis (TB). QuantiFERON-TB Gold (QFT) is a simple blood to detect Mycobacterium tuberculosis and a modern alternative to the tuberculin skin test (TST, PPD or Mantoux) because it requires only one patient visit and is unaffected by previous Bacille Calmette-Guerin (BCG) vaccination. This test can be used to screen diabetic patients for TB. The aim of this study is to investigate whether diabetic patients are more likely to be QFT (+) than their matched non-diabetic counterparts.

Design and method: This is a case-controlled (quantitative, non-interventional, analytical) study conducted by screening electronic patient records. Ethics committee approval was obtained before data collection.

The scope of this study was composed of all patients who had a Quantiferon Test taken between 2014 and 2019. Records of 400 individuals were randomly selected (case/control ratio 1/3) where cases were defined as Quantiferon test (+) and controls were individuals without Tuberculosis who tested Quantiferon (-). Exposure to diabetes was verified by screening the patient records for ICD-10 codes for type 2 diabetes mellitus (E-8-13, especially E-11 for T2DM).

Results: A total of 273 patient records were enrolled (mean age 48.19±12.4 years. 54% (n = 147) male, QFT (+) cases (n = 97, 36%) and QFT (-) controls (n = 176, 64%)). QFT(+) cases were more likely to have diabetes than QFT(-) controls (37% T2DM in cases vs. 22% T2DM in controls; OR 2.14, 95% confidence interval 1.2 to 3.7, p = 0.005).

Conclusions: In the light of the results of the present study, we can conclude that diabetic individuals are more prone to be QFT (+) and thus, more likely to be TB+.

Benefits of adding dapagliflozin to insulin in patients with type 2 diabetes

Irine Lomtadze[1], Tamari Khutsishvili[2], Nino Eloshvili[3], Nana Tonia[4], Nazibrola Chiradze[5]

[1] Aversi Clinic, [2] Research Institute of Clinical Medicine, [3] New Hospitals, [4] MediClubGeorgia, [5] LTD Diacor

Aim(s) or purpose: Chronic overdosing of insulin is a widespread issue not only in Georgia, but also in many countries. Additionally, SGLT2 inhibitors have verified cardiovascular and renal benefits. The goal of our research was to study the effects of reducing excessive insulin doses and replacing them with Dapagliflozine in type 2 diabetes (T2D) patients.

Design and method: We selected 31 patients (main group) with inadequately controlled T2D on multidose insulin and metformin (2000 mg daily). We investigated following data: HbA1c (8.9±1.3%), blood pressure (mean A/T 151/87 mmHg), Body Mass Index - BMI (36.5±4.7 kg/m2), and C-Peptide in normal range. In the main group insulin doses were reduced and Dapagliflozin 10mg once daily were added. In the control group (n = 15), only the Insulin dose correction was made, and recommendations of lifestyle modification were given. We estimated the parameters of change after 6 months of corrected treatment.

Results: Due to the addition of Dapagliflozin and insulin dose reduction (9±5 U) we have a statistically significant improvement of certain parameters in the main group compared to the control group: HbA1c decreased by 1.1±0.2% (8.6±1.3 vs 7.5±1.1, $p<0.001$) compared to the control group reduction of 0.4±0.1%. Body weight was reduced by 2.9± 1.3kg ($p<0.001$), in the control group the body weight increased by 0.4± 0.1kg. Systolic blood pressure decreased by 9.2±3.1mm/Hg, compared to the control group reduction of 3.4±1.1 mm/Hg.

Conclusions: Our results suggest that an insulin dose reduction with Dapagliflozin replacement cause significant improvement in body weight, blood pressure, and glycemic control.

Excessive doses of insulin lead to weight gain and can provoke a proatherogenic effect. Insofar as Dapagliflozin has cardiovascular and renal benefits, we recommend the partial replacement of excessive insulin doses with Dapagliflozin.

Bexagliflozin in patients with type 2 diabetes: A scoping review of the published randomised control trials

Vivek Redkar[1], Sagar Redkar[2], Manohar Inamdar[3], Shreya Das[4], Rajarshee Das[5], Muskan Arora[6]

[1] Redkar Hospitals and KIMS, [2] Redkar Hospital, [3] Ashwini Hospital, [4] Smt Kashibai Navle Medical College, [5] MGM Medical College, [6] Rajiv Gandhi Medical College

Aim(s) or purpose: The US Food and Drug Administration (FDA) has recently approved bexagliflozin, a new SGLT2 inhibitor. We examined the outcomes and metabolic effects of bexagliflozin across the published Randomised Controlled Trials (RCCTs).

Design and method: A comprehensive literature search was done to extract publications from Medline-PubMed and the Cochrane Library from inception until January 20, 2023, then screened and reviewed

by two independent reviewers. Data including study title, year of publication, name of the journal, study design, and the evaluated outcomes were charted to summarise the evidence. A scoping review was performed according to PRISMA-SR checklist. We included only the RCCTs for evaluation.

Results: We analysed 12 publications and evaluated five RCCTs with 1,704 T2DM cumulatively contributing to the evidence base for bexagliflozin. The mean duration of the trials (weeks) was 50(±42, minimum 12, maximum 96, 95% CI -1.6 to 102). The mean number of T2DM evaluated across RCCTs were 341(±62, minimum 288, maximum 426, 95% CI 264 to 418). Each RCCT has been distinct from the others in terms of comparison with glimepiride, dose-finding study, evaluation as monotherapy, comparison with sitagliptin, and evaluation in patients with CKD stage 3a or 3b. The findings include that bexagliflozin was not inferior to glimepiride in lowering HbA1c, was superior to glimepiride for decreases in body mass and SBP and was associated with significantly fewer hypoglycaemic events than glimepiride; bexagliflozin confers substantial and dose-dependent benefits, is not inferior to sitagliptin and provides benefits over sitagliptin in FPG and body mass. The results support the usage in patients with stage 3a/3b CKD. The initial results of the Bexagliflozin Efficacy and Safety Trial (BEST) support the benefits in patients with high cardiovascular risk.

Conclusions: The synthesis of the evidence from our analysis reflects that bexagliflozin has a durable, clinically meaningful improvement in glycaemic control.

Challenges of Diabetes Care among Ukrainian Primary Care Providers

Iryna Voloshyna[1]

[1] Zaporozhye State Medical University

Aim(s) or purpose: To assess the main gaps and challenges in diabetes care among Ukrainian Primary Care providers.

Design and method: We conducted a 5-question survey of Primary Care providers across Ukraine in a specialized Facebook group to reveal the main gaps and challenges in diabetes management between 5-20 January 2020.

Results: Three hundred twenty family physicians with an average clinical experience of 7±2 years participated in this study. 51.8% indicated that they were not at all aware of new agents for T2 diabetes treatment. 53.5% of practitioners mentioned the economic inaccessibility of patients to get new diabetes drugs. 39% of responders felt unsure in a multidisciplinary team reporting the need for nurses to receive further training on skills. 24% indicated limitations in diabetes diagnostic estimation in rural areas.

Conclusions: There are many gaps and challenges in diabetes care in Ukraine on a Primary Care level. A system administrative approach and updated educational programs on diabetes should be applied to Primary Care providers in terms of evidence-based assessment and management of diabetes.

Cardiovascular outcomes with dulaglutide in type 2 diabetes: The REWIND trial

Irene Romera[1]*, Hertzel C Gerstein*[2]*, Helen M Colhoun*[3]*, Gilles R Dagenais*[4]*, Rafael Diaz*[5]

[1] Lilly Spain, [2] Population Health Research Institute, McMaster University and Hamilton Health Sciences, [3] University of Edinburgh, [4] Institut Universitaire de Cardiologie et Pneumologie, Université Laval, [5] ECLA, Estudios Clínicos Latinoamérica

Aim(s) or purpose: The Researching Cardiovascular Events with a Weekly Incretin in Diabetes (REWIND) trial investigated the effects of the glucagon-like peptide-1 (GLP-1) receptor agonist dulaglutide on cardiovascular (CV) outcomes in adults with type 2 diabetes (T2D) with and without previous CV disease.

Design and method: REWIND was a global, double-blind, randomised, placebo-controlled trial (ClinicalTrials.gov NCT01394952). Participants aged 50 years and older with T2D, HbA1c less than or equal to 9.5 percent, and CV risk factors or previous CV disease were randomised to a weekly injection of dulaglutide 1.5 mg or placebo. The primary outcome was the first occurrence of a composite CV endpoint: non-fatal myocardial infarction, non-fatal stroke, or death from CV or unknown causes.

Results: 9,901 participants (mean age 66.2 years, 46.3 percent women, median HbA1c 7.2 percent, previous

CV disease 31.5 percent) were randomised to dulaglutide (n = 4949) or placebo (n = 4952). Median follow-up was 5.4 years. The primary outcome occurred in 594 (12.0 percent) dulaglutide-treated and 663 (13.4 percent) placebo-treated participants [incidence rates 2.4 vs. 2.7 per 100 person-years]; (hazard ratio [HR] 0.88, 95 percent confidence interval [CI] 0.79–0.99; p = 0.026). Consistent effects were observed for all three components of the composite primary outcome ($P_{heterogeneity}$ = 0.89). The HR was similar in those with and without previous CV disease ($P_{interaction}$ = 0.97). Gastrointestinal adverse events were reported in 2,347 (47.4 percent) dulaglutide-treated and 1,687 (34.1 percent) placebo-treated participants (p less than 0.0001).

Conclusions: Dulaglutide safely reduced CV events over 5 years in people aged 50 years and older with T2D, whose baseline characteristics were largely representative of the general T2D population, with similar benefits in those with and without previous CV disease.

Characteristics associated with the risk of chronic renal disease according to KDIGO in patients with type 2 diabetes mellitus over 65 years old. ESCADIAN study

Ana Cebrián-Cuenca[1], Josep Franch-Nadal[2], Domingo Orozco-Beltrán[3], José Millaruelo-Trillo[4]

[1] Cartagena Casco Primary Care Center, [2] Raval-Sud Primary Care Center, [3] Research Unit Cabo Huertas Primary Care Center, [4] Torrero-La Paz Primary Care Center

Aim(s) or purpose: To analyze the characteristics associated with the different stages of the risk of renal progression in people with type 2 diabetes mellitus (T2DM) age 65 years or older.

Design and method: Observational, cross-sectional, multicenter nationwide study. Patients with known T2DM, age 65 or older treated in Primary Care Centers in Spain were included. Demographic, anthropometric, and lipid profile and other variables of the last 12 months were collected, including the urine albumin creatinine ratio (ACR) and estimated glomerular filtration rate (eGFR) to assess the risk of chronic kidney disease (CKD) according to the KDIGO criteria and classify it into 4 categories: low, moderate, high, and very high.

Results: 608 patients were included. 51.7% of the subjects presented low risk; 22.6% were at moderate risk; 10.1% were at high risk and 6.5% were at very high risk. 16% of T2DM subjects > 65 years old have a high or very high risk of CKD. In T2DM patients age 65 or older, the risk of CKD is associated ($p<0.05$) with age (78 vs 74 years), comorbidity (100 vs 35.5%), ischemic heart disease (35 vs 12.1%), stroke (25 vs 9.6%), peripheral vasculopathy (20 vs 6.8%), neuropathy (20 vs 3.3%) and retinopathy (35 vs 10.1%), lack of studies (40 vs 22.6%), higher levels of triglycerides (155 vs 132 mg/dl), higher systolic blood pressure (139 vs 133 mmHg) and lower use of metformin (27.5 vs 75%) but not associated (not statistically significant) with the male sex (47 vs 48%), weight (76 vs 75 kg), BMI (30.0 vs 29.2), years since the onset of T2DM (13 vs 11 years), use of statins (77 vs 65%), or glycemic level (138 vs 138 mg/dl).

Conclusions: The high risk of CKD is associated with older age, comorbidity, higher levels of triglycerides, higher levels of systolic blood pressure, presence of complications, lower level of studies and lower use of metformin but not associated with sex, weight, BMI, years since the onset of T2DM, or the glycemic level.

Combining the chronic care model with process and outcome indicators to measure quality of care for diabetes in Belgium: a unique way toward a comprehensive view on quality of care.

Katrien Danhieux[1], Philippe Bos[1], Edwin Wouters[1], Josefien Van Olmen[1], Veerle Buffel[1]

[1] University of Antwerp

Aim(s) or purpose: In Belgium, as in other countries, the accessibility and quality of diabetes services are suboptimal. Primary care was originally built to serve acute diseases, and providing organization for chronic diseases is lagging behind. The Chronic Care Model (CCM) provides guidance on how to improve. Although it is a robust model, it only focuses on structure indicators, whereas process and outcome indicators are needed to capture the complete picture. Therefore, our hypothesis is that practices in Belgium scoring higher on the implementation of the CCM for diabetes also score higher on process and

outcome indicators.

Design and method: 66 Primary Care practices were sampled. They had different organizational types and different team compositions. The Assessment of Chronic Illness Care (ACIC), based on CCM was used to measure the quality dimension structure. Health insurance data and lab data were used to measure process and outcome indicators. Multilevel logistic regression models with patients nested within GP practices were estimated.

Results: When looking at the dimension structure, multidisciplinary and capitation-based practices scored considerably higher than traditional monodisciplinary fee-for-service practices on the overall ACIC score. However, this was not directly reflected in the process and outcome indicators, possibly due to a lack of power. The preliminary results do show that a higher overall ACIC score was associated with higher odds of appropriate follow-up and better treatment.

Conclusions: We managed to create a comprehensive view on the multidimensional quality of care for chronic diseases, which is innovative and important for policy makers and practitioners to scale-up the quality of diabetes care. Analyses show that the degree of implementation of the elements of the CCM is related to follow-up and treatment success. This suggests that organizing a different Primary Care practice can be important for the lives of patients with chronic diseases.

Comorbidities and cardiovascular risk factors of patients with type 2 diabetes mellitus (T2DM) according to degree of obesity

Mercè Villaró[1], Carlos Gómez[2], Rosa Madridejos[1], Ferran Flor[2]
[1] Mútua de Terrassa, [2] Consorci Sanitari Integral

Aim(s) or purpose: To analyze the prevalence of cardiovascular risk factors and the main comorbidities of a population with T2DM according to the degree of obesity.

Design and method: A descriptive, multicenter cross-sectional study was conducted in five Primary Care centers established in two main urban areas in the province of Barcelona (total population: 148,255). Data was obtained via the electronic medical records of patients over the age of 15 diagnosed with T2DM (ICD-10) from 2018 to 2019.

Anthropometric and clinical variables of diabetes comorbidities and cardiovascular risk factors were collected using data anonymization practices. The statistical analysis was performed with EPIDAT and G-STAT statistical packages.

Results: The prevalence of T2DM was between 7.2% and 10.4% according to geographical location, and the mean age was 69 with 7 years since the onset of diabetes mellitus. The mean HbA1c was 7.1%.

37.01% of patients were categorized as Obese (grade I: 24.9%; grade II: 8.46%; and morbidly obese: 3.65%). Higher rates of obesity increased blood pressure and decreased control over blood pressure, while also increasing dyslipidemia and liver enzyme levels. There was a greater presence of obstructive sleep apnea syndrome and heart failure in those with T2DM with a higher degree of obesity, as well as a comorbidity. However, we did not observe an increased presence of cardiovascular disease, nor could we relate obesity to a higher incidence of chronic kidney disease. T2DM control worsened as BMI increased.

Conclusions: The degree of obesity in patients with T2DM correlates with cardiovascular risk factors and heart failure but not with other cardiovascular diseases.

Comorbid depression and risk of cardiac events and cardiac mortality in people with diabetes: A systematic review and meta-analysis

Aaisha Farooqi[1]
[1]Birmingham City University (UK)

Aim(s) or purpose: To examine the association of the comorbid occurrence of diabetes and depression with a risk of cardiovascular endpoints including cardiovascular mortality, coronary heart disease and stroke.

Design and method: A systematic review and meta-analysis. We searched the PUBMED/MEDLINE, Medscape, Cochrane Library, CINAHL, EMBASE and Scopus databases assessing cardiac events and mortality associated with depression in diabetes up until 1 December 2018. Pooled hazard ratios were calculated using random effects models.

Results: Nine studies met the inclusion criteria. The combined pooled hazard ratios showed a significant association of cardiac events in people with depression and type 2 diabetes, compared to those with type 2 diabetes alone. For cardiovascular mortality the pooled hazard ratio was 1.48 (95% CI: 1.185, 1.845), p = 0.001, for coronary heart disease the ratio was 1.37 (1.165, 1.605), p< 0.001 and for stroke the ratio was 1.33 (1.291, 1.369), p< 0.001. Heterogeneity was high in the meta-analysis for stroke events (I-squared = 84.7%) but was lower for coronary heart disease and cardiovascular mortality (15% and 43.4% respectively). Meta-regression analyses showed that depression was not significantly associated with the study level covariates: mean age, duration of diabetes, length of follow-up, BMI, sex, and ethnicity (p< 0.05 for all models). Only three studies were found that examined the association of depression in type 1 diabetes. There was a high degree of heterogeneity and data synthesis was not conducted for these studies.

Conclusions: We have demonstrated a 47.9% increase in cardiovascular mortality, a 36.8% increase in coronary heart disease and a 32.9% increase in stroke in people with diabetes and comorbid depression. The presence of depression in a person with diabetes should trigger the consideration of evidence-based therapies for cardiovascular disease prevention irrespective of the baseline risk of cardiovascular disease or duration of diabetes.

Comparison of bariatric surgery methods in patients with type 2 diabetes

Tamari Khutsishvili[1], Irine Lomtadze[2], Nana Tonia[3]

[1] Research institute of Clinical Medicine, [2] Aversi Clinic, [3] MediClubGeorgia

Aim(s) or purpose: Presently, obesity is one of the most widespread medical problems. Laparoscopic Sleeve Gastrectomy (LSG) is one of the most popular restrictive bariatric methods for weight loss. In recent years, Laparoscopic Gastric Plication (LGP) was introduced as another restrictive bariatric method.

In this study, we aimed to compare results of LSG with the results of recently introduced LGP.

Design and method: All patients who underwent LSG or LGP between the years 2016-2018 were retrospectively analyzed. Age, sex, BMI, Preoperative levels of FG, A1c, Cholesterol, A/T were determined. Indications for operation were specified as patients with T2D and a BMI 38 kg/m2 or higher.

Results: The study group consisted of 44 patients (20 men, 24 women), age - 37±8.7 years, BMI 43.4±5.0. The 26 patients who underwent LSG formed Group 1, and the 18 patients who underwent LPG formed Group 2. The length of hospital stay was 5.5±0.5 in Gr.1, 3.2±0.8 days in Gr. 2.

There were no significant changes in BMI, BG, A1c decrease between the Groups in the first and sixth months, though the decrease was statistically significant in favour of LSG in the twelfth month.

Comparison of body weight and medical parameters at the 12-month follow-up visit:

	BMI (kg/m^2)	Fasting Glucose (mg/dl)	Cholesterol (mg/dl)	ALT (U/L)	A/T (mm/Hg)
Group 1	26.5+/- 2	102+/-6	204 +/-8	32.4+/-4	122+/-10
Group 2	27.9 +/- 2	108 +/-8	213+/-10	33.6+/-6	127+/-15

Conclusions: LGP and LSG are both efficient. We found that LSG is more effective at increasing weight loss and improved medical parameters (BG, A1C) are more visible using LSG method. However, LGP is a good alternative with a shorter length of hospital stay, an easier technique. Nevertheless, in the long run it is less efficient than LGP.

COMPLEMENT (COMPLEte MENToring and diabetes training for pharmacists in Primary Care)

Fiona Munday[1], *Laura Willcocks*[1]
[1] EDEN Leicester Diabetes Centre

Aim(s) or purpose: NHS England are taking measures to counteract the decline in numbers of GP's and Practice Nurses through their Long-Term Plan.

Clinical pharmacists are a valuable and growing group, alleviating the Primary Care burden, and providing appointments for patients to have quality time with a Health Care Professional.

According to EDEN's award winning 'Knowledge and Confidence' questionnaire, many pharmacists did not feel ready to offer diabetes care without further training and mentorship.

Design and method: EDEN's initiative is a 6-month diabetes training programme entitled 'COMPLEMENT'.

The initiative meets the need in Primary Care to rapidly upskill clinical pharmacists.

The aim of 'COMPLEMENT' is to increase pharmacists' knowledge and confidence in holistic diabetes care, in order to improve the quality of life and longevity for people living with diabetes.

COMPLEMENT consists of 3 elements:

1. Face to face education.

2. Mentorship programme.

3. Case study based on workshops.

Results: We evaluated the initiative in 3 ways:

- Pre and post HbA1c, BP and Lipids.
- Patient feedback questionnaire.
- Pre- and post-'COMPLEMENT' Knowledge and Confidence Questionnaire

Results (from 30 randomly selected patients seen by the pharmacist):

- Mean HbA1c reduction: 18.2%
- Mean total cholesterol reduction: 12.9%
- Mean Systolic BP reduction: 5.9%
- Mean Diastolic BP reduction: 7.1%

Results from the Patient Feedback Questionnaire:

- 97% of patients were very satisfied.
- 3% were satisfied.
- 100% said they were confident in the pharmacist's ability and would want further reviews with them.

Results from the Knowledge and Confidence Questionnaire:

- The pharmacists' knowledge and confidence in diabetes had increased by 60% in some areas.

Conclusions: The patients' results and feedback show that COMPLEMENT achieves its aims!

As one pharmacist said:

"The support from EDEN has helped me so much and the mentoring has been invaluable".

EDEN developed a successful model, and the programme is launching a distance learning version.

Consensus Towards Reassessing Gliclazide for a Place in Therapy Based on a Novel Cluster Classification of Diabetes

Bipin Sethi[1], A G Unnikrishnan[2], Usha Ayyagari[3], Prem Narayanan[4], Raviraj Acharya[5], Karthik Balachandran[6]

[1] CARE Hospitals, [2] Chellaram Diabetes Institute, [3] Apollo Speciality Hospital, [4] Ahalia Diabetes Hospital, [5] Kasturba Medical College, [6] Sri Ramachandra Medical College and Research Institute

Aim(s) or purpose: A novel classification of adult-onset DM into five subgroups: Severe Autoimmune Diabetes (SAID); Severe Insulin-Deficient Diabetes (SIDD); Severe Insulin-Resistant Diabetes (SIRD); Mild Obesity-Related Diabetes (MOD); and Mild Age-Related Diabetes (MARD) has been postulated. We aim to formulate a consensus towards reassessing gliclazide use based on cluster classification of T2DM.

Design and method: A collaborative educational initiative was convened through nationwide virtual meetings by leading diabetologists-endocrinologists (n = 150) at the forefront of diabetes care (RECLIDE Study Group). The cumulative clinical experience was approximately 4,000-person-years, who rated their level of agreement for 13 questions on a 5-point Likert scale. Consensus was pre-defined as a weighted mean score > 50.

Results: The highest agreement score was as follows for the consensus statements: early intervention with gliclazide is associated with a reduction in risk factors of T2DM (124), gliclazide differs from other sulfonylureas (SUs) and may provide a suitable option for some patients with T2D (124), gliclazide, among SUs gliclazide has a minimal risk of hypoglycaemia (124). This was followed by gliclazide is a relevant SU for people who are inclined to fast during Ramadan, (114), gliclazide is relevant for mild age-related diabetes (MARD, cluster 5) (98), it is relevant for mild obesity-related diabetes (MOD, cluster 4) (62). The highest mean response scores for consensus (±SD, 95% CI) were for agree (54.7±19.2, 95% CI 43.1 to 66.4) followed by strongly agree (27.6±19.7, 95% CI 14.3 to 40.9), neither agree nor disagree (23±21.5, 95% CI 10 to 36.1), disagree (14.1±13.5, 95% CI 4.3 to 23.8), and strongly disagree (4.5±5, 95% CI -3.4 to 12.4).

Conclusions: We observed a high preference for the usage of gliclazide in MARD and MOD. Despite the evolution of a vast array of therapeutic options for management of T2DM, gliclazide still holds a distinctive place in clinical practice. Gliclazide has stood the test of time and it appears that gliclazide will continue to contribute towards patient-oriented diabetes care.

Conversations and Reactions Around Severe Hypoglycaemia (CRASH): Spanish Results from a Global Study

Miriam Rubio Santos[1], Jesus Reviriego[2], F. Javier Ampudia-Blasco[3], Esther Artime[2], Silvia Diaz[2], Beth Mitchell[4]

[1] Lilly Spain, [2] Eli Lilly and Company, [3] Clinic University Hospital Valencia, Valencia University Faculty of Medicine, [4] Eli Lilly and Company

Aim(s) or purpose: The CRASH cross-sectional survey examined the experience of patients with diabetes regarding severe hypoglycemic events (SHEs) and management strategies.

Design and method: Patients with self-reported type 1 (T1D) or type 2 (T2D) diabetes were recruited in 8 countries. Inclusion criteria: age 18 years and older, informed consent given, receiving insulin, and SHE (low blood sugar associated with severe cognitive impairment requiring external assistance) within 3 years. Data obtained via an online survey from the most recent SHE for patients In Spain are reported.

Results: The mean time since diagnosis was 23.1 (T1D; N = 106) and 11.7 (T2D; N = 88) years. The median number of SHEs per patient (past 12 months) was 1.0 (both T1D and T2D), 31.1 percent (T1D) and 27.3 percent (T2D) of patients reporting impaired awareness of hypoglycemia. The mean time since the most recent SHE was 0.4 (T1D) and 0.6 (T2D) years; most occurred at home (75.5 percent T1D; 83.0 percent T2D). Glucagon use was infrequent (17.0 percent T1D; 12.5 percent T2D), lack of availability (20.7 percent T1D; 18.7 percent T2D) or prescription (17.2 percent T1D; 53.3 percent T2D) were among the most common reasons. Many patients (37.7 percent T1D; 63.6 percent T2D) felt unprepared. Most patients discussed their most recent SHE with their healthcare professional (69.8 percent T1D; 75.0 percent T2D) but few obtained glucagon afterwards (11.3 percent T1D; 11.4 percent T2D). Less than half of patients reported discussing SHEs at every clinic visit (34.9 percent T1D; 42.0 percent T2D).

Conclusions: Most SHEs were treated at home. The frequency of glucagon use and discussions with healthcare providers were below expectations based on current guideline recommendations.

Correlation study between diabetes mellitus and sleep disturbances

Cristiano Crisafulli[1], Manuela Nicotra[1], Massimo Catanuso[1], Annalisa Vetri[1], Antonino Di Guardo[1]
[1] Italian College of General Practitioners

Aim(s) or purpose: Diabetes has been related to sleep disorders (SD) in several scientific studies, but the selection of the population is not comparable with real life. SD are related to a higher prevalence of hypertension and alterations of lipids and glycemia due to the hyperactivation of the sympathetic nervous system. We sought to evaluate the prevalence of SD in all populations in real life and in diabetic patients to clarify if there were statistically significant differences between the groups.

Design and method: From an initial population of 7,408 subjects from 5 General Practitioners, we enrolled 351 subjects and assessed the prevalence of SD by prescribing hypnotic, benzodiazepine and hypno-inducing drugs. In the group of diabetics, we also evaluated if the glycemia worsened as a consequence of the SD. All data were statistically evaluated with the Student's t-test and the chi-squared test.

Results: The prevalence of SD in all population was 20.35% while in the diabetic the prevalence was 32.96%. There were no statistically significant differences for other variables. After dividing the diabetic group into two groups (with and without SD), there was a statistically significant difference in the mean glycate values ($p = 0.0032$). The odds ratio of patients with SD that could develop diabetes was 1.5730 (95% CI = 1.1494 - 2.1526) with a $p = 0.0047$.

Conclusions: The widespread low attention paid to SD led us to reflect on the basis that diseases which do not receive major consideration may strongly relate to several diseases (oncological, dysmetabolic, cardiovascular) that are important in real life and where general practitioners can incisively act in primary prevention. Over the last years, the over-prescription of hypno-inducing drugs without the application of the correct rules of sleep medicine has likely been widespread. Sleep medicine and its relation to chronic diseases can remarkably show the GP as the protagonist of initiative medicine, carrying out a primary low-cost prevention that is essential for the patient's health.

Cost as a barrier to effective glycemic control in T1DM

Shruti Sheth[1], Banshi Saboo[1], Aakash Prajapati[1], Malay Parekh[1], Vidisha Patel[1], Dharmendra Panchal[1]
[1] Diacare - Diabetes Care Clinic and Hormone Centre

Aim(s) or purpose: To observe the difference in HbA1c levels between Analog insulin users vs Human insulin users in Type 1 DM.

Design and method: Our Type 1 diabetes register at Diacare – Diabetes Care and Hormone Centre was screened for the last 9 months records. Patients who had complete data in the register with a regular follow up history were selected. They were further divided based on their insulin use (human insulin (n1 - 142) vs Analog insulin (n2 - 150). Their anthropometric (Height and weight), HbA1c and hypoglycemia profiles were analysed.

Results: 150 patients were analog insulin users and 142 patients were human insulin users. Cost was listed as the reason for using human insulin for 94% of the human insulin users.

Insulin	HbA1c 1	HbA1c 2	HbA1c 3	Weight 1	Weight 2	Weight 3	Height 1	Height 2	Height 3
Analog	9.84	8.54	7.96	38.6	41.63	44.66	145.6	152.3	154.55
Human	9.99	9.56	8.87	40.62	45.12	46.38	146.56	151.3	153.6

Analog insulin users had a dramatic improvement in their HbA1c profile over the 9-month period. Anthropometry measurements showed a similar increase between the two groups. Hypoglycemia was

noted more often in patients using human insulin (14%) as compared to those taking analog insulin (4%), especially nocturnal hypoglycemia.

Conclusions: Cost is a major issue when it comes to determining long term insulin usage amongst Type 1 diabetes individuals in India. Our study showed that analogue insulin use had a better chance at improving and maintaining HbA1c than human insulin without causing many instances of hypoglycemia.

Country background, education level, employment, and disability in young-onset type 2 diabetes

Katrina Tibballs[1], Lars Kirkebøen[2], Anne Karen Jenum[1], Jørund Straand[1], Esben Selmer[1]

[1] Department of General Practice, University of Oslo, [2] Statistics Norway

Aim(s) or purpose: Young-onset type 2 diabetes (YOD – diagnosis before age 40) entails a high disease burden and is mainly managed in general practice. Knowledge of how socioeconomic status and country background impact the risk of YOD is scarce. We aimed to study the effects of education level and country background on the risk of YOD and the effects of YOD on employment and disability.

Design and method: Cross-sectional data on 10,241 T2D individuals from Norwegian general practices (ROSA 4 study, 2014), linked to data on country background, education level, disability benefits, and employment, were compared with population data matched for age, sex, and residential area. Using negative binomial regression and adjusting for age and sex, we analysed the risk of YOD by country background and education level, and the effects of YOD on risk of disability and absence from the labour market.

Results: T2D risk was increased in people with a non-Western compared to Norwegian background. South Asian individuals exhibited the greatest risk increase, five-fold for T2D (adjusted incidence rate ratio, aIRR 4.7 (4.3-5.2)) and nine-fold for YOD (aIRR 8.9 (7.3-11.0)). T2D risk in people with low education was almost double that in high education (aIRR 1.8 (1.7-2.0)), with YOD risk significantly higher (aIRR 2.3 (1.9-2.9)) than for later onset T2D. There was significant interaction between low education and country background, with only people of a Western background exhibiting a substantially increased risk of YOD (aIRR 3.2 (2.4-4.4)). Disability risk was doubled in T2D (aIRR 2.2 (2.0-2.3) and three-fold higher in YOD (aIRR 3.1 (2.7-3.5) than in the general population. Workforce participation was only reduced in T2D individuals diagnosed before age 50.

Conclusions: People with a non-Western, particularly South Asian background, and low education were associated with an increased risk of YOD. Low education was an important YOD risk factor only for people of a Western background. The risk of disability and labour market absence was significantly higher in YOD than in later onset T2D and in the general population.

Defining remission of type 2 diabetes in research studies: A systematic scoping review

Mireille Captieux[1], Regina Prigge[1], Sarah Wild[1], Bruce Guthrie[1]

[1] University of Edinburgh

Aim(s) or purpose: There is no consensus on how to define remission of type 2 diabetes, however, remission is commonly used as an outcome in research studies. It is not clear which definition of remission is best suited for use in Primary Care. An American Diabetes Association 2009 consensus report was the first to suggest three components necessary to define remission: (1) absence of glucose lowering treatment (GLT), (2) normoglycaemia, and (3) for duration of at least 1 year. Our aim is to systematically review how remission of type 2 diabetes has been defined by observational and interventional studies since the publication of the 2009 consensus report in order to contribute to developing future consensus on defining type 2 diabetes remission.

Design and method: Four databases (MEDLINE, EMBASE, Cochrane library, CINAHL) were searched for studies published from 01.09.2009-05.03.2019 which included an outcome of type 2 diabetes remission. Remission definitions were extracted and categorised based on a registered protocol (PROSPERO CRD42019144619).

Results: 8345 titles/abstracts were screened. 156 studies were included, contributing 236 definitions, of which 88 were unique. The 2009 consensus report was referenced in 112 (47%) definitions. 222 (94%) definitions required the absence of glucose lowering therapy. 206 (87%) definitions specified numeric glycaemic thresholds. The most frequently used thresholds were HbA1c<48mmol/mol (85 definitions) and HbA1c<42mmol/mol (83 definitions) with or without normoglycaemic fasting plasma glucose. Time was frequently omitted, though 138 (58%) definitions specified time.

Conclusions: There is substantial heterogeneity in the definition of remission in research studies published since 2009, partly reflecting ambiguity in the 2009 consensus report. Any new consensus definition of type 2 diabetes remission should include unambiguous glycaemic thresholds and emphasise duration. Studies describing remission should clearly define all three components of remission. Remission definitions based on HbA1c or fasting plasma glucose alone may create practical issues in Primary Care.

Dementia patients with a migration background and the use of healthcare: what is the influence of a diabetes diagnosis?

Bianca Strooij[1,2], Marieke Blom[1,2], Hein van Hout[1,4], Otto Maarsingh[1,4], Karlijn Joling[3,4], Petra Elders[1,2]

[1] Amsterdam UMC location Vrije Universiteit, General Practice, [2] Amsterdam Public Health, Health Behaviours and Chronic Diseases, [3] Amsterdam UMC location Vrije Universiteit, Medicine for Older People, [4] Amsterdam Public Health, Aging and Later Life

Aim(s) or purpose: Dementia patients with a non-western migration background (migrants) experience barriers in access to care, leading to differences in healthcare use compared to native populations. Diabetes mellitus (DM) is a common co-diagnosis in dementia. Differences in healthcare use are expected to be less pronounced between Dutch native (DN) individuals and migrants with DM, because of the strict routine care programs for DM. This study aims to assess whether a DM diagnosis is an effect modifier of the association between healthcare use and migration background in older dementia patients.

Design and method: Observational study based on routine care data from electronic health records of general practitioners (GP) linked with records from Statistics Netherlands. All community-dwelling dementia patients in the Netherlands aged 65 years and older in 2013-2014 were included. Migration background was defined using country of birth. Healthcare use outcomes included hospital admissions, home care and GP contacts, and differences were analysed using negative binomial and logistic regression analyses.

Results: 138,864 dementia patients were included, of which 3,991 were migrants and 132,477 were DN-persons. 47.2% of migrants had a co-diagnosis of DM, compared to 21.1% of DN-persons. Migrants had more unplanned hospital admissions (OR 1.09, 95%CI 1.01-1.18), and less GP and paramedical home visits (OR 0.50, 95%CI 0.43-0.57; IRR 0.48, 95%CI 0.36-0.62). A diagnosis of DM was only an effect modifier in home care use ($p<0.001$), showing greater differences between migrants and DN-persons in people with DM (OR 1.76) compared to no DM (OR 1.49).

Conclusions: These findings suggest that having DM does not influence the association between healthcare use and migration background in older dementia patients, despite routine DM care programmes. However, further research is needed on participation in these DM programmes by migrants with dementia, and the quality of DM care for this vulnerable group of patients.

Diabetic Retinopathy Predicts Mortality and Cardiovascular Events in Type 2 Diabetes in Primary Care in Catalonia (Spain)

Joan Barrot[1], Sonia Miravet[2], Manel Mata[2], Dídac Mauricio[2], Josep Franch[2], Xavier Mundet[3]

[1] Institut Catala de la Salut, Primary Care, [2] Institut Català de la Salut, Primary Care, [3] Institut Català de la Salut, Hospital Sant Pau

Aim(s) or purpose: Diabetic retinopathy (DR) is considered a microvascular and neurovascular complication. Nevertheless, a relationship with macrovascular comorbidities, including stroke, transient ischemic attack (TIA), myocardial infarction (MI), and peripheral arterial disease, and an increased risk of all-cause mortality compared with patients who do not have retinopathy, has also been suggested.

The aim of this study was to assess the associations between DR and common macrovascular complications and mortality in type 2 diabetes (T2DM).

Design and method: A population-based cohort study of patients with T2DM in Catalonia (Spain). Patients aged 31-90 years without cardiovascular events, screened with retinal photography, and DR category available from January of 2008 to December 2012. Clinical data were obtained retrospectively from the electronic clinical records from a population database (SIDIAP).

Results: We analysed 219,385 patients with T2DM, with a mean age of 64.6 ± 11.6 years, 55.7% were male, and with a mean T2DM duration of 5.2 ± 5.3 years. 22,402 patients were affected with some kind of DR. The mean age was 67 ± 11.6 years, 54.9% were male, and the mean T2DM duration was 8.1 ± 6.8 years. Age, fasting plasma glucose, HbA1c, T2D duration, body mass index, lipids, blood pressure, eFG, and albuminuria were significantly associated with DR ($p < 0.001$).

In the multivariate analysis, compared with participants without DR, those with any kind of DR had an increased risk of mortality [OR 1.46: 95% CI 1.40-1.53], MI [OR 1.53: 95% CI 1.40-1.66], stroke [OR 1.39: 95% CI 1.29-1.50] and TIA [OR 1.14:95% CI 1.02-1.29].

Conclusions: There is clear evidence of the relationship between DR and macrovascular complications. In this population database study DR is a strong predictor of stroke, myocardial infarction, and mortality.

Diabetic foot in family and community medicine: emergency and Primary Care

Ana Ramos[1], Beatriz Martín[2], Raisa Álvarez[1], Ángela María Arévalo[1], Nieves Sobradillo[2]

[1] Parquesol Health Center, [2] Río Hortega Hospital

Aim(s) or purpose: Diabetic foot is the most easily detected and preventable complication. It causes more hospital admissions in diabetics than any other long-term complication, generating a high mortality and impacting quality of life. The risk is 25%, and it is responsible for 50% of non-traumatic amputations with an annual incidence of 4%, higher in men, of which 85% previously presented an ulcer.

Design and method: 72-year-old male, unknown drug allergies. History of: type 2 Diabetes Mellitus, smoker, hypertension, dyslipidemia, liver cirrhosis. Usual treatment: Simvastatin 20mg, Enalapril 20mg, Basal Insulin 14U+Rapid 4-4-4U. Independent for basic activities of daily living. The patient visits his family doctor for revision of the interdigital space of the 1st left toe. Shows progressive injury of uncertain chronology, which is painless, not consulting previously. No other associated conditions. Glycated hemoglobin: 9%. Adequate footwear. Physical examination: Capillary glycemia: 148mg/dl, rest in range. Glasgow 15. Cardiovascular and abdominal physical examination: anodyne. Examination of lower limbs: Left: lack of pedio and posterior tibial pulses, no femoral murmurs, interdigital ulcer with necrotic borders, exposed bone without superinfection. Ipswich test: 0/3. Fingerboard: negative. Right: anodyne. Monofilament 10 g: 3/8.

Results: Referral to Hospital Emergency Department: Blood test: no alterations. Glucose: 412. ECG: Sinus. X-ray of the chest and left foot: unremarkable. Lower Limb Doppler: no distal left flows. Diagnosis: Ischemic Ulcer Risk 2. Treatment: Debridement, cure. Intravenous perfusion: insulin 1U/minute.

Admission to the Angiology and Vascular Surgery Service: Major amputation.

Conclusions: Enhance the role of Primary Care. Enabling a comprehensive approach, control risk factors, providing a directed physical examination, a screening program, educational measures for the patient and their environment, are the basic and more effective pillar. The Emergency Department must determine the presence or absence of ischemia, which is a prognostic condition and confirm whether or not the infections are necrotizing and potentially lethal. The family physician is the first contact, and a multidisciplinary approach with an established protocol to diabetic foot is necessary, given its frequency and mortality.

Diabetic retinopathy (DR) screening using an artificial intelligence application

Ramon Sagarra[1,4], Pere Romero[2,4], Aida Valls[3,4], Domenec Puig[3,4], Antonio Moreno[3,4], Marc Baiget[2,4]

[1] Institut Català de la Salut (ICS). Primary Health Care, CAP Sant Pere. Area Reus-Altebrat, [2] University Hospital Sant

Joan. Ophthalmic Service, [3] University Rovira & Virgili. Department of Computer Engineering and Mathematics, [4] Institut d'Investigacions Sanitàries Pere Virgili (IISPV)

Aim(s) or purpose:

To develop a tool that will be able to:

1. Stratify patients based on their risk of developing DR.

2. Calculate their next screening appointment based on that risk.

3. Offer prevention interventions for patients to self-manage their risk.

Design and method: This tool would merge our existing, validated software through general population data:

- A diagnostic assistance system through the Clinical Decision Support System (CDSS), validated in a population of 139,658 patients, which enables detection of patients at risk using 9 validated variables (current age, sex, duration and treatment of DM, arterial hypertension, body mass index, HbA1c, estimated glomerular filtration rate, and microalbuminuria).
- A DR Deep Learning Algorithm (DLA), validated with 106,341 retinographies that stratifies patients into 4 levels of severity.

Both systems have been built using Machine Learning techniques based on Artificial Intelligence:

CDSS Retiprogram uses Fuzzy Random Forests to build a set of rules with linguistic variables. The image classification model is built with Deep Learning techniques based on neural networks.

Results: The accuracy of the CDSS was 80.76%, the sensitivity was 80.67% and the specificity was 85.96%.

Results of any-DR (using DLA software) were: accuracy 0.969, sensitivity 0.985, specificity 0.853, positive predictive value 0.969, negative predictive value 0.884.

Conclusions: Unlike other existing models, validated with EyePACS and/or MESSIDOR-2, our application has also been applied to the general population. In addition, it also takes into account the associated risk factors for DR and provides the patient with a personalized treatment plan based on their level of risk, allowing patients to set up their next appointment based on the resulting risk level.

This makes it possible to increase access to additional DR patients for detection annually and reduce the number of patients that reach the later stages of DR, due to the greater efficiency in their stratification, thus also reducing treatment costs.

Diagnosis coding of incident chronic kidney disease in type 2 diabetes within UK Primary Care

Rose Sisk[1], Camilla Sammut-Powell[1], Rory Cameron[1], Waqas Tahir[2]
[1] Gendius Ltd, [2] Affinity Care, National Health Service

Aim(s) or purpose: Type 2 diabetes is a leading cause of both chronic kidney disease (CKD) and onward progression to end stage renal disease. Timely diagnosis coding of CKD can facilitate early intervention, leading to improvements in quality of care and patient outcomes.

The aim of this study is to assess the consistency between estimated glomerular filtration rate (eGFR) based evidence of CKD (two eGFRs less than 60 ml/min/1.73m^2 at least 90 days apart) and CKD diagnosis coding in UK Primary Care.

Design and method: We conducted a retrospective analysis of electronic health record data in a cohort of 32,276 people with type 2 diabetes from 60 Primary Care centres within England between 2012 and 2022. We estimated the incidence rate of CKD per 100 person-years using eGFR measurements and diagnosis codes. Multivariable logistic regression was applied to establish which attributes of patients with eGFR-based CKD were associated with diagnosis coding. Time from eGFR-based CKD to entry of a diagnosis code was summarised using the median and interquartile range.

Results: The overall incidence of CKD was 2.32 per 100 person-years, 95% CI: (2.24, 2.41) and significantly different between eGFR-based CKD and diagnosis codes (1.98, 95% CI: (1.90, 2.05) vs 1.06, 95% CI: (1.00, 1.11) respectively; p<0.001). Only 45% (1210/2667) of eGFR-based CKD incidences had a corresponding diagnosis code, with a median delay of 9.8 months (interquartile range: 1.2 – 24.3 months). Younger patients (p<0.001), patients with a higher severity CKD G-stage (p = 0.03), and patients with an observed urine albumin-creatinine ratio (p = 0.01) with eGFR-based CKD were significantly more likely to have a corresponding diagnosis code.

Conclusions: Diagnosis coding of patients with eGFR-based evidence of CKD in UK Primary Care is poor within patients with type 2 diabetes, despite CKD being a well-known complication of diabetes.

Effect of body protein mass on glycemic control and insulin resistance

Shruti Sheth[1], Banshi Saboo[1], Vidisha Patel[1], Malay Parekh[1], Aakash Prajapati[1], Dhruvi Hasnani[1]

[1] Diacare-Diabetes Care and Hormone Clinic

Aim(s) or purpose: To understand the effect of Body Protein mass on glycemic control and insulin resistance.

Design and method: Study design - Retrospective study. This data analysis study was done at Diacare-Diabetes Care and Hormone Clinic using data collected over 3 months (November 2019-January 2020). The InBody770 Body Composition Analyser data was extracted and the lab data for those patients was retrieved. The body protein mass from the InBody770 was studied in relation to the patient HbA1c and HOMA-IR levels.

Data from a total of 297 patients was retrieved. 56 were non diabetic obese patients and 69 patients had incomplete data. The data from the other 172 patients was included in the study. This patient data were further divided into different categories according to the HbA1c (5.5-6.59%, 6.6-8.59%, 8.6-10) and HOMA-IR (<3, 3-5, 5-10, >10).

Results: There was a significant difference between HOMA-IR and Body Protein mass in which low protein levels corresponded to higher insulin resistance. However, in this study we found no significant difference in Protein mass in relation to HbA1c.

HbA1c range	HbA1c (mean)	Protein mass	p value
5.5-6.59 (n = 40)	6.65	9.27	<0.05
6.6-8.59 (n = 42)	7.6	8.83	>0.05
8.6-10 (n = 41)	9.5	8.84	>0.05

HOMA-IR range	HOMA-IR (Mean)	Protein mass	p value
Normal (<3)	2.12	9.27	<0.05
Moderate (3-5)	3.85	8.90	<0.05
Severe 1 (5-10)	6.71	8.49	<0.05
Severe 2 (>10)	12.37	6.99	<0.05

Conclusions: Our study depicted that as the insulin resistance increased from normal to severe on the insulin resistance spectrum, body protein mass showed a significant decrease respectively. However, the effect of Body Protein Mass on HbA1c was not significant.

Eruptive xanthomatosis as the first symptom of type 2 diabetes mellitus

Victoria Tkachenko[1], Olga Bondar[2], Alla Ostroverha[2], Nelya Vydyborets[2]

[1] Shupyk National Medical Academy of Postgraduate Education, [2] Kyiv Regional Clinical Hospital

Aim(s) or purpose: Eruptive xanthomatosis is a rare skin condition caused by dyslipidemia and it manifests as firm, yellow waxy pea-like bumps on the skin surrounded by red halos. It can occur in people with poorly controlled diabetes who have very high triglycerides and high cholesterol.

The aim of the study is to describe the clinical case of the onset of diabetes with eruptive xanthomatosis

Design and method: Methods. The clinical case of a 20-year-old male patient who came to his physician with complaints of a progressive rash without any additional symptoms, which appeared 2 years ago but started to progress rapidly 6 months ago. Blood tests were taken – HbA1c, lipid profile, biochemical indexes, uric acid, etc. The ultrasound and consultations from specialists were provided.

Results: Results. The objective examinations confirmed the presence of the rash mostly on the elbows, knees, buttocks, back and a little bit on the face. Body mass index – 25 kg/m^2. The blood test were as follows: HbA1c = 12.3%, uric acid = 430 mmol/l, cholesterol = 9.98 mmol/l, triglycerides = 39.1 mmol/l, C-peptide = 2.81 ng/ml, insulin = 14.9 mU/l, HOMA index = 9.5, anti-GAD <5. Ultrasound – hepatosplenomegalia.

Conclusions: Conclusion. The eruptive xanthomatosis was recognized as the manifestation of familial hypertriglyceridemia, as dyslipidemia, which led to a deeper metabolic imbalance – including carbohydrate and protein disorders, such as type 2 diabetes mellitus and hyperuricemia. Primary care physicians should be aware of eruptive xanthomatosis as an unusual rash that is connected with metabolic imbalance, and it can be the one of first symptoms of diabetes.

Evaluation of glycemic control in relation to peripheral arterial disease, nephropathy, and dyslipidemia in type 2 diabetes patients: insights from the Comprehensive Care Program

Ragini Rohatgi[1], *Sonali Ghodke*[1], *Daisy Alfred*[1]

[1] Rohit Diabetes Centre

Aim(s) or purpose: We analysed the data from the patients attending a single centre (n = 142), an advanced diabetes care centre delivering a comprehensive care approach, with values beyond the normal targets, for either HbA1c, LDL-C, Ankle Brachial Index (ABI), Toe Brachial Index (TBI) or Albumin Creatinine Ratio (ACR). The percentage of patients achieving the target values were classified as ATV (Achievers for the Target Value).

Design and method: 142 patients (68 M, 74 F) were evaluated for glycaemic and non-glycaemic parameters (lipid profile, ABI, TBI, UACR). The mean age was 53 years (SD ± 12, 95% CI 50 to 55), mean duration of the diabetes was 8.2 years (SD ± 6.9, 95% CI 7.1 to 9.4). 5 patients reported macroalbuminuria (ACR > 300) and 54 patients had microalbuminuria (ACR 30-300).

Results: Table- HbA1c and Non-Glycaemic Measures as a Marker for Comprehensive Diabetes Care

	Mean	± SD	95% CI	Not within target (%) ATV
HbA1c (target <7%)	8.5	1.9	8.2 to 8.8	37 (26.2)
LDL-C (target <100mg/dl)	95	37	88 to 101	92 (64.7%)
ABI- Right (target 1-1.29)	1.2	0.12	1.2 to 1.2	111 (78.1%)
ABI- Left (target 1-1.29)	1.2	0.12	1.2 to 1.2	106 (74.6%)
TBI- Right (target 0.5-0.75)	1	0.31	0.95 to 1.1	17 (11.9%)
TBI- Left (target 0.5-0.75)	1	0.28	0.99 to 1.1	13 (9.15%)
Albumin Creatinine Ratio (ACR) (Normal <30)	49	77	36 to 61	83 (58.4%)
Serum Creatinine (mg/dl)	0.93	0.69	0.81 to 1	119 (83.8%)
eGFR (90 mL/min/1.73m^2)	92	23	88 to 96	85 (59.8%)

Conclusions: The target for TBI (left side) had the highest rate of success, with 9.15% of patients not within the desired values. An HbA1c of < 7 was not achieved by 63% of patients. Our comprehensive care approach

complements clinical decision-making tools to allocate the resources to intervene early to minimise the complications of diabetes and improve outcomes.

Evaluation of the impact of a group and an individual intervention on the perception of risk of fasting during Ramadan in type 2 diabetic patients from Pakistan

Meritxell Gabarró[1], María Almazán[1], Ainoa Martínez[1], Alba Garcia[1], Eulàlia Borrell[1], Judit Llussà[1]

[1] CAP Sant Roc

Aim(s) or purpose: To assess whether an individual and a group educational intervention modifies the perception of the risk of fasting during Ramadan for type 2 diabetic patients of Pakistani origin attended in a Primary Care center.

Design and method: The study took place before and after a clinical trial on type 2 diabetic patients of Pakistani origin treated at a health center who agreed to participate. Sample of 80 patients. Main variable: Perception of the risk of fasting during Ramadan; independent variables: gender, age, risk group associated with fasting (redGDPS), medication, diabetes complications, and family support. Group educational intervention plus individual intervention 3 months after with the participation of a cultural mediator in both of them. Analysis: Comparison of percentages using the McNemar's test.

Results: Of the total eligible subjects (57 men and 33 women, aged between 32 and 71), 31 were not located because they were in Pakistan or did not respond to the telephone contact (with no differences by age and sex with those located). Of those contacted, 56 agreed to participate, but only 16 completed both interventions (11 men and 5 women, between 34 and 66 years old): 7 with HbA1C> = 8; 2 without diabetes treatment. Of the 8 subjects who at the beginning had no perceived risk of fasting, 7 changed their opinion after the intervention (p = 0.016). Despite this, of the 11 (2 women and 9 men) who initially thought of observing Ramadan, 9 continued with the idea (2 women and 7 men), 7 of whom had a high risk associated with fasting despite the fact that 6 had changed their perception of risk.

Conclusions: In subjects who have observed Ramadan, an educational intervention increases the perception of the risk of fasting, but it does not change the intention to perform it. The cultural influence of this event likely outweighs the possible associated risks.

Evolution of the degree of monitoring of patients with type 2 diabetes in Aragón during the period 2018-2021

Irantzu Bengoa[1,2], Sara Malo[1], Sara Castel[1], María José Rabanaque[1], Isabel Aguilar[1]

[1] Grupo de investigación en servicios sanitarios de Aragón, [2] Hospital Clínico Universitario Lozano Blesa

Aim(s) or purpose: Type 2 diabetes mellitus (DM2) is an important cause of morbidity and mortality with a growing prevalence in our country. Following up on and monitoring these patients is essential in order to avoid macro- and microvascular complications.

Design and method: Descriptive observational study in time-slices taking patients with DM2 in Aragón in 2017 as the study population. The scope of the study is the CARhES (CArdiovascular Risk factors for HEalth Services research) cohort, a dynamic cohort that collects information on patients with cardiovascular risk factors in Aragon and integrates information obtained from different administrative databases. Subjects with DM2 in Aragón in 2017 were selected and their analytical determinations (Hb1Ac, LDL, HDL, glomerular filtration rate (GFR), and albuminuria) and blood pressure (BP) in the period 2018-21 were described, and their evolution was analysed.

Results: Over the period, there was a progressive increase in the percentage of patients without Hb1Ac determination, from 42.5% in 2018 to 79.3% in 2021. The same increase is observed for LDL, from 48.1% in 2018 to 83% in 2021 and for HDL, from 45.1% to 82.4%. The percentage of patients without GFR and albuminuria determinations progressively increased from 54.2% to 84.3% and from 76.6% to 91.4%, respectively. For BP measurements, the percentage of patients without measurements increased from 36.8% to 57.7%, with a significant increase to 80.8% in 2020.

Conclusions: The percentage of patients with DM2 whose analytical determinations have not been regularly monitored has been progressively increasing from 2018 to 2021. It is necessary to study whether this decrease in the monitoring of patients with DM2 has had an impact on their health outcomes.

Impact of Diabetic Foot Ulcer on the Quality of Life of Diabetic patients in the state of Khartoum in 2020

Yusra Hussein Ibrahim[1], OSAMA AHMED ABDELRAHIM[2]

[1] University of Khartoum, Faculty of Medicine, [2] University of Khartoum, Faculty of Medicine

Aim(s) or purpose: A novel study in Sudan aimed at comparing health-related quality of life (HRQoL) between Diabetic Foot Ulcer (DFU) patients and Diabetes patients without DFU. Additionally, the study aims to determine which factors correlate with lower HRQoL.

Design and method: A descriptive, cross-sectional study with a comparative group was held in three diabetes centers in Khartoum in 2020. 120 Sudanese diabetic patients (mean age = 52 years) were divided into two groups, without DFU and with DFU, and interviewed in person. Demographic and clinical variables were recorded, HRQoL was evaluated using standardized the RAND 36 (SF-36) survey for all participants. The HRQoL domains and total score were compared in the two groups using t-test. Inference against socio-demographic data was found using Pearson's and ANOVA.

Results: The DFU group (36 males, 24 females) scored significantly lower in 5 (*functioning [physical, social], role [physical, emotional], bodily pain)* yet higher in 2 (*general health perception, emotional well-being*) of the 8 HRQoL subscales compared to the non-DFU diabetic group (31 males, 29 females). The energy/fatigue level subscale remained insignificant. Being a female (P = 0.03), painful ulcers (p = 0.001), Insulin use (p = 0.04) and newly developed ulcer (P = 0.005) were associated with lower HRQoL total scores in the DFU group. However, educational level had a positive correlation (P = 0.02).

Conclusions: DFU patients have a lower HRQoL compared to diabetic population without DFU especially in the physical health aspects and need more support. Healthcare workers should provide disease-specific education and set realistic expectations regarding ulcer's impact, healing, and management, especially in patients with predictors of poor HRQoL. Moreover, physical rehabilitation programs are recommended. Future studies should use different assessment tools that are sensitive to Sudanese culture.

Impact of the COVID19 pandemic in the Netherlands on primary health care use and clinical outcomes in people with type 2 diabetes

Jesse van den Berg[1,2,3], Marieke Blom[1,2], Karin Swart[1,2,3], Jetty Overbeek[1,2,3], Petra Elders[1,2], Ron Herings[2,3,4]

[1] Department of General Practice, Amsterdam UMC location Vrije Universiteit Amsterdam, [2] Amsterdam Public Health, Health Behaviors & Chronic Diseases, [3] PHARMO Institute for Drug Outcomes Research, [4] Department of Epidemiology and Data Science, Amsterdam UMC location Vrije Universiteit Amsterdam

Aim(s) or purpose: The COVID19 pandemic has disrupted healthcare systems globally, resulting in the postponement or cancellation of critical appointments and procedures, including chronic care for type 2 diabetes (T2D) patients in the Netherlands. During the first wave of the pandemic, general practitioners (GPs) supposedly saw fewer T2D patients. This study aimed to determine the pandemic's effect on healthcare use and clinical outcomes among T2D patients.

Design and method: The study analyzed data from the DIAbetes MANagement and Treatment (DIAMANT) cohort, which comprises electronic medical records from Dutch GPs. Descriptive analyses, Poisson models, and GEE models were used to evaluate patient characteristics and clinical measurements, including HbA1c, BMI, LDL, eGFR, and blood pressure, in 2019 and 2020. The study compared the number of clinical measurements and GP visits in both years.

Results: The cohort included 191,267 T2D patients (47% women, mean age 69 (± 13) years) on March 1, 2019. Preliminary results indicated a reduction in clinical measurements in 2020, specifically for blood pressure (-31%), BMI (-28%), HbA1c (-17%), LDL (-9%), and eGFR (-8%). While the number of GP office visits (+7%) and

phone calls (+29%) increased, home visits decreased (-7%). At the population level, there was a significant 1.1 mmol/mol increase in HbA1c levels in 2020 compared to 2019. Observed changes in BMI, LDL, and blood pressure were statistically significant but small. Changes were greater in low-risk populations.

Conclusions: During the first year of the pandemic in the Netherlands, changes in primary healthcare use were observed among T2D patients, with an increase in GP office visits and phone calls and a decrease in clinical measurements and home visits. Moreover, there was an increase in HbA1c levels in 2020. Future research is needed to determine the pandemic's potential impact on patients with less healthcare use in 2020 and whether the increase in HbA1c levels is associated with long-term T2D complications.

Incidence of diabetic retinopathy in type 2 diabetes mellitus patients in an eight-year follow-up cohort study in Primary Care in Catalonia

Sònia Miravet-Jiménez[1,2], Joan Barrot-de la Puente[1,3], Manel Mata-Cases[1,4], Xavier Mundet-Tuduri[1], Dídac Mauricio[1,6], Josep Franch-Nadal[1,5]

[1] DAP-Cat Group. Unitat de Suport a la Recerca Barcelona Ciutat, Institut Universitari d'Investigació en Atenció Primària Jordi Gol (IDIAP Jordi Gol), [2] Catalan Health Institute. EAP Martorell urbà, [3] Catalan Health Institute. CAP Jòrdia Nadal. Salt, [4] Catalan Health Institute. CAP La Mina, [5] Catalan Health Institute. EAP Raval Sud, [6] Department of Endocrinology & Nutrition, Hospital de la Santa Creu i Sant Pau

Aim(s) or purpose: To determine the incidence of any degree of diabetic retinopathy (DR), and to identify the risk factors associated with this complication, in a population-based study of patients with type 2 diabetes mellitus (T2DM) receiving care in Primary Care Centers in Catalonia.

Design and method: We studied a population-based cohort study of T2DM patients (aged 31 to 90) with retinal photography over an eight-year follow-up period (January 2008 to December 2015) in Catalonia (Spain) The levels of DR were classified as: mild non-proliferative DR (mild NPDR), moderate NPDR, severe NPDR, proliferative DR (PDR), and diabetic macular edema (DMO).

Clinical data were obtained retrospectively from the SIDIAP database (System for Research and Development in Primary Care).

Results: The database included 216,617 T2DM patients with a mean age of 65.1±11.4 years, 57.5% were male with a mean duration of T2DM of 4.98±5.04 years. Patients were screened a mean number of 3.71 times over these years. Comorbidities were present in 73.4% of patients. The median follow-up period was 58.44 months (up to 10 years). The cumulative incidence of any DR at follow-up was 7.82% and the incidence density was 2.91 cases per 100 patient/years. Most of the cases were classified as mild (56.8%), or moderate (20.23%) NPDR. Vision-threatening DR was present in 5.15% of patients (1.21% severe NPDR; 1.76% PDR and 2.18% DMO). In the multivariate analysis, higher HbA1c at baseline [HR 3.60; 95% CI 3.39-3.84], longer diabetes duration [HR 2.53; 95% CI 2.28-2.82], and the presence of hypertension [HR 1.16; 95% CI 1.07-1.27] were statistically significant associated with the incidence of DR.

Conclusions: After the eight-year follow-up, the cumulative incidence of DR was similar to other studies carried out in Primary Care. An association was found with poor glycemic control, the duration of diabetes, and hypertension.

Influenza vaccination coverage in diabetes patients - results of primary health care practices in Latvia

Jānis Blumfelds[1], Vija Siliņa[1], Sandra Gintere[1], Ilze Skuja[1], Ainis Dzalbs[1], Jeļena Daņiļenko[1]

[1] Riga Stradins University Department of Family Medicine

Aim(s) or purpose: To assess the adherence to the 2019/2020 seasonal influenza vaccine in adult type 1 and type 2 diabetes patients.

Design and method: This study was retrospective and was performed by obtaining patient data from the clinical records of 6 general practitioner practices in Riga, the suburbs of Riga, and the surrounding

rural areas, selecting patients with diabetes who were registered as patients of those practices. Only vaccinations carried out in those practices were taken into the account. The data was processed using Microsoft excel and IBM SPSS statistics software.

Results: Data was collected from 409 diabetes patients. The mean age of population was 63.7 years. On average 36% of studied patients received the influenza vaccine during this season. 62.2% of the vaccinated patients were female and 37.8% were male. Of the GP practices analysed, the highest adherence found in one practice was 75.3% (110 of all vaccinated patients), followed by 20%. Other practices recorded 17.4%, 15.25%, 14.1% and 11.9% adherence, showing the existing differences between practices.

Conclusions: Despite the influenza vaccine being partly compensated and recommended in patients with chronic metabolic diseases due to a higher risk of complications, the vaccination rate can be considered low, though there are practices that are able to achieve high adherence. The challenge remains to find best approach and to acknowledge the methods used by some of the practices to receive higher patient adherence in this field.

Interrelationship of sleep disturbance, serotonin levels, and diabetes risks in obese patients.

Taisiia Bagro[1], Victoria Tkachenko[1]

[1] Department of Family Medicine, Shupyk National Healthcare University of Ukraine

Aim(s) or purpose: To determine the interrelationship between sleep disturbance, serotonin levels, and diabetes risk in obese patients.

Design and method: 75 patients (39 women and 36 men) with a BMI of 30-40 kg/m^2, aged 39.03±0.93 years were studied, who were assessed for sleep quality and sleepiness using the Epworth Sleepiness Scale (ESS), the Pittsburgh Sleep Quality Index (PSQI); for diabetes risk using the FINDRISC questionnaire; the serotonin level in the blood was determined. The statistical analysis was performed using IBM SPSS Statistics and Statistica 12; the descriptive statistical analysis was performed with Excel 2010.

Results: The PSQI analysis determined seven aspects of sleep (Sleep quality (2.05±0.10), Sleep latency (1.73±0.10), Sleep duration (1.13±0.12), Habitual sleep efficiency (0.47±0.06), Sleep disturbance (1.57±0.06), Use of sleeping medication (0.09±0.04), Daytime dysfunction (1.39±0.08) and one total score (8.44±0.35 points). The ESS corresponded to 8.49±0.46 points. A negative medium correlation was determined between the serotonin level (154.91±2.49 µg/l) and sleep quality scores (r = -0.66), sleepiness level (r = -0.66). The risk of developing diabetes was 13.32±0.48 points, which correlated with BMI (r = 0.39) and serotonin level (r = -0.33), however, there was no correlation with sleep quality (r = 0.25) and daytime sleepiness (r = 0.26).

Conclusions: The risk of diabetes was moderate over the next 10 years (one in every sixth patient). The lower serotonin level correlated with a higher diabetes risk, BMI, and poor sleep quality and excessive daytime sleepiness in obese patients. The obtained results can be considered when choosing treatment options for obese patients.

Less is more: a process analysis of the optimalisation of medication in older patients with type 2 diabetes mellitus (OMED2) intervention pilot study

Marieke T. Blom[1,2], Beryl A. van Hoek[1,2], Anne W. De Boer[3], Rimke C. Vos[3], Karin M. Swart[1,4], Petra J. Elders[1,2]

[1] Amsterdam UMC, location Vrije Universiteit, [2] Amsterdam Public Health, Health Behaviours & Chronic Diseases, [3] Leiden Universitair Medisch Centrum, [4] PHARMO Institute for Drug Outcomes Research

Aim(s) or purpose: Older patients with type 2 diabetes (T2D) are regularly over-treated, with risk of hypoglycaemia due to excessively stringent glucose regulation with glucose lowering medication (GLM) as a result. Therefore, a GLM-deprescription programme for patients aged >=70 years was designed, consisting of i) a selection tool used in the electronic medical record (EMR) system identifying eligible patients, ii) a training programme for general practitioners (GPs) and nurse practitioners (NPs), iii) supporting practice visits by research assistants and iv) the option to consult experts. Here, we evaluate barriers and facilitators for implementing the deprescription programme in a pilot study prior to the full programme.

Design and method: Notes from training meetings and interviews with GPs (n = 6), NPs (n = 7) and patients (n = 5) were analysed by at least two researchers (BvH, LV, PE), for a qualitative analysis based on the Extended Normalisation Process Theory (ENPT), identifying barriers and facilitators for deprescription.

Results: Nine GP-practices participated in the pilot study. Using the EMR-selection tool, 71 patients were found eligible. Barriers to implementation were: 1) time investment for meetings and monitoring; 2) study-related tasks performed by the NPs that are not part of the Primary Care process; 3) lack of experience with deprescribing and fear of adverse consequences; 4) lack of experience with the EMR-selection tool; and 5) lack of experience in performing deprescribing consultations.

Enabling factors were: 1) practical on-site help by research assistants; 2) case studies in the education material; 3) role-play to rehearse the deprescribing consultation; and 4) the option to consult the expert team.

Conclusions: The deprescription programme is feasible in general practice. Results of this pilot are used to adapt the final programme: deprescribing steps are decreased to reduce anxiety and to better fit in with routine care, while maintaining practical help of research assistants, and ensuring the complete separation of study-related and healthcare-related processes.

Life after COVID, Primary Care's struggle to catch up on type 2 diabetes

Ana Esteban[1], James Richard Moore[1], Juana Flores[1], Ana Maria Cebrián[1]

[1] Centro de Salud Casco Antiguo

Aim(s) or purpose: Diabetes mellitus is a chronic disease with a 10.5% prevalence worldwide, which is increasing due to an aging population, affecting the burden of care. During the COVID19 pandemic, diabetic care models in Primary Care underwent a radical change, negatively affecting the metabolic controls of people with type 2 diabetes (PWD2).

As the COVID19 pandemic takes a backseat thanks to mass vaccination it is time to regain control of chronic diseases. According to the World Bank´s document "Walking the talk: Reimagining Primary Health Care after COVID19" we are facing a historic moment for change to restructure our health systems. We must first evaluate the damage caused by COVID19 to the diabetic population.

Design and method: An observational descriptive study was performed with PWD2 in the Primary Care setting to understand the effect that the COVID19 pandemic had on DM2 care. A multidisciplinary team from the basic health zone of Casco Antiguo Cartagena reviewed the participants' medical history and performed a physical examination and blood tests. The results were then analyzed using a statistical program in order to establish the current situation of the diabetic population.

Results: A total of 35 participants who averaged 14 years since the diagnosis of type 2 diabetes were recruited: 34.3% presented poor glycemic control, 46% had complications related to the disease, 88.5% presented a BMI over 25 and 48.8% were classified as obese.

Conclusions: Despite the fact that the study sample was small it provides a brief idea of the state of PWD2 post COVID19. Reduced glycemic control, high cardiovascular risk and an increase of associated complications were present.

Diabetes as a chronic disease requires a lifelong commitment from both patients and healthcare systems. After seeing the effects that the pandemic has had on PWD2, we can safely say it is time to take action, equipping HCP with the skills to educate their patients about diabetic self-management.

Long term obesity management continues to be a challenge

Berit L Heitmann[1,2], Graham C Horgan[3], Antonio L Palmeira[4], Sofus C Larsen[2], Cristiana Duarte[5], James R Stubbs[5]

[1] Section for general practice, Dept. Public health, Copenhagen University (Denmark), [2] The Parker Institute, Frederiksberg Hospital (Denmark), [3] BioSS, Biomathematics and Statistics Scotland (UK), [4] Faculty of Human Kinetics, University of Lisbon (Portugal), [5] School of Psychology, Faculty of Medicine and Health, University of Leeds (UK)

Aim(s) or purpose: In Western societies, 80% of patients diagnosed with T2D have obesity, and most benefit greatly from weight loss. However, while many patients can lose some weight, most soon regain what was lost and hence, the initial metabolic benefit achieved reverts or disappears. There is some suggestion that self-regulation of eating and activity behaviours are important for weight loss maintenance (WLM) and improvement in emotional and stress regulation also support WLM. The Horizon2020 NoHoW project (Grant#:643309) therefore developed and tested a new evidence-based digital WLM tool with self-regulation/motivation and emotional/stress regulation components.

Design and method: A multicentre 2x2 factorial RCT to improve WLM and metabolic outcomes by 1) self-regulation and motivation, 2) emotional and stress regulation or 3) these factors combined, compared with 4) control, was conducted among 1627 overweight/obese participants (~70% women) from Portugal, the UK, and Denmark, who all had achieved >5% weight loss during the year prior to enrolment.

Results: Overall, ITT analyses of the changes over 12 months (missing imputation assuming the weight was regained) showed no overall differences in WLM. However, we found some evidence of effect modification by gender.

Women: Arm 1:4.75±0.58kg; Arm 2:4.47±0.56kg; Arm 3:4.73±0.57kg; Controls:4.73±0.57kg.

Men: Arm 1:3.28±0.85kg; Arm 2:5.71±0.84kg; Arm 3:4.41±0.86kg; Controls:4.62±0.84kg.

Men in the self-regulation/motivation arm regained 1.34kg less weight than controls ($p = 0.04$), but this was not enough to make the overall effect significant, as men were underrepresented among the participants. Similarly, no intervention effects were seen for changes in HbA1c, blood pressure or lipids (all $p>0.05$). These results remained after 18 months of intervention.

Conclusions: The lack of clinically meaningful effectiveness of WLM is disappointing, not least for general practice, but our results are nonetheless consistent with similar discouraging results from systematic reviews and meta-analyses and recent European multicentre trials as well as other, large trials (DiOGenes, PREVIEW, and NuLevel) which have also found intervention differences of 0-2 kg, only.

Low vitamin A during fetal development may increase the risk of developing Type-2 diabetes

Berit L Heitmann[1,2], Lars Ängquist[3], Ramune Jacobsen[4], Allan A Vaag[5], Amelie C Keller[6]

[1] Section for general practice, Dept. of Public Health, Copenhagen University (Denmark), [2] The Parker Institute, Frederiksberg Hospital (Denmark), [3] Novo Nordisk Foundation Center for Basic Metabolic Research, Copenhagen University (Denmark), [4] Research Group for Social and Clinical Pharmacy, Department of Pharmacy, University of Copenhagen (Denmark), [5] Steno Diabetes Center Copenhagen, Region (Denmark), [6] Section for Epidemiology, Dept. of Public Health, Copenhagen University (Denmark)

Aim(s) or purpose: Type-2 diabetes (T2D) develops in the genetically susceptible in response to environmental triggers such as obesity, sedentarism, and unhealthy diets. However, environmental factors already during fetal development may also influence susceptibility to T2D. In animal studies, vitamin-A deficiency has been associated with impaired fetal pancreatic development and increased risk of developing T2D, but until now, no human studies have explored if low gestational vitamin-A increases the risk of adult T2D. Thus, the present study aimed to determine if risk of T2D in the offspring of mothers, who received extra vitamin-A from food fortification during pregnancy, was lower than among offspring of mothers receiving less vitamin-A.

Design and method: On 1 March 1962, mandatory margarine fortification with vitamin-A was increased in Denmark by 25%. We examined individual risk of developing T2D until midlife, among all individuals (n = 193,803) born either during 1 September 1959-31 December 1960 (low gestational exposure) or during 1 December 1962-31 March 1964 (25% extra gestational exposure). The date of T2D diagnosis was retrieved from the National Diabetes Registry.

Results: Among those exposed to additional vitamin A, 1,273 developed T2D; among those less-exposed 1,322 developed T2D. Cox-regression analysis showed that the individuals exposed to higher vitamin-A were less likely to develop T2D than individuals exposed to lower levels: OR = 0·88; 95%CI: 0·81-0·95 ($p = 0·001$).

Conclusions: Knowledge about modifiable factors of importance for the primary prevention of T2D is imperative, and this study shows that fetal exposure to extra vitamin-A added to margarine may reduce

T2D-risk until mid-life by about 12%. These results are relevant for General Practice/Family Medicine as this is the first point of contact with pregnant mothers, and GPs often consult with women before they conceive. This study also has public health relevance and demonstrates the potential benefit of a simple societal intervention using food fortification with vitamin-A for the risk of developing T2D, one of today's most expensive chronic diseases.

Nasal versus injected glucagon: User experience results of a simulated severe hypoglycemia study

Miriam Rubio Santos[1], Julie Settles[2], Gregg Gerety[3], Sanjay Bajpai[2], Erik Spaepen[2], Jeffrey G Suico[2]
[1] Lilly Spain, [2] Eli Lilly and Company, [3] Albany Medical College

Aim(s) or purpose: Injectable glucagon (IG) use is challenging for caregivers of a person with diabetes (PWD) in stressful severe hypoglycemia (SH) rescue. The success rates, administration time, user preference for nasal glucagon (NG) vs IG device were evaluated after treating an SH simulation (sim).

Design and method: Adult PWDs trained caregivers to use NG or IG. Untrained adults, inexperienced with PWDs, were shown one device. 1 week later, both user groups attempted administration to a manikin in a real-life SH sim. Administration success (complete dose+critical steps) and time (seconds) were studied. Videos of the sims were viewed and user/PWD perceptions were assessed by comparative questionnaires.

Results: 90 percent (28/31) and 16 percent (5/32) of caregivers succeeded with NG and IG. 91 percent (30/33) of untrained users succeeded with NG, 0 percent with IG. Successful NG administration took 30 seconds for both user groups; 5 IG trained users succeeded in 73 seconds. Users, successful with either device, preferred the NG; PWDs felt safer with the NG, even with successful IG dosing. Successful administrations and user preferences included (N[percent]:NG/IG): ease of preparation (PWD-trained: 26[92.9]/4[80.0]; untrained: 24[85.7]/NA); confidence of using the device correctly (PWD-trained: 22[78.6]/3[60.0]; untrained: 27[96.4]/NA); easy-to-use (PWD-trained: 23[82.1]/4[80.0]; untrained: 27[96.4]/NA); satisfaction (PWD-trained: 22[78.6]/3[60.0]; untrained: 24[85.7]/NA); preference (PWD-trained: 24[85.7]/4[80.0]; untrained: 26[92.9]/NA). Untrained and PWD-trained users were equally successful dosing NG. IG succeeded only with training.

Conclusions: Users were more successful and faster administering NG vs IG. None who preferred IG were successful with IG, while few successful IG users preferred NG or stated no preference. NG success was independent of training; ease of preparation/use likely contributes to overall preference.

Notifications for a good life – Use of mobile apps for diabetes care

Vidisha Patel[1]
[1] Diacare, Diabetes Care & Hormone Clinic

Aim(s) or purpose: The aim of the study was to understand the impact of using mobile applications for diabetes care as one of the key factors to achieve good glucose monitoring, conscious eating, improved physical activity, & HbA1c.

Design and method: Prospective case control study. Over a period of three months, OPD patients were observed at Diacare diabetes care & hormone clinic, Nehru Nagar, Ahmedabad, India. The patients were divided into diabetes application users (221 patients) vs non users (311 patients). Patients' anthropometry, HbA1c, and SMBG were recorded while their lifestyle (diet & physical activity) was reviewed during their routine clinic follow up visits for three months.

Results: Of the patients who were using diabetes mobile applications, 192 (86.8%) patients monitored their sugars well, had good glucose control, a proper diet & tracked calories intake along with performing some form of physical activity while out of the patients who did not use applications, only 102 (32.8%) patients showed good results.

There was a significant drop in HbA1c amongst app users (6.9%) compared to non app users (7.5%). Diet

(59.27%) and physical activity (63.34%) records were well charted by mobile app users which may have contributed to their improved BMI (24.8%) after 3 months.

	Application User		Patients who did not use an application	
	Before	**After**	**Before**	**After**
HbA1C (%)	8.6	6.9	8.9	7.5
BMI (kg/m²)	27.4	24.8	27	26.1
Diet record (n/total participants)		131/221		41/311
Physical activity record (n/total participants)		140/221		77/311

Conclusions: Our study showed that as many as 86.8% of patients who used applications had improved self-management of their diabetes compared to only 32.8% of patients who did not use them. Mobile applications to monitor diabetes are a good tool for motivation and encouragement for patients for SMBG, glucose control & lifestyle modifications.

Non-mydriatic retinography camera, our 11-year Primary Care course. Will we be able to maintain adequate diabetic retinopathy screening?

Ramon Sagarra[1,4], Pere Romero[2,4], Marc Baget[2,4], Josep Basora[1,4], Raul Navarro[3,4], Francesc Barrio[1]

[1] Institut Català de la Salut (ICS). Primary Health Care, CAP Sant Pere. Area Reus-Altebrat, [2] University Hospital Sant Joan. Ophthalmic Service, [3] University Rovira & Virgili. Department of Computer Engineering and Mathematics, [4] Institut d'Investigacions Sanitàries Pere Virgili (IISPV)

Aim(s) or purpose: To analyze:

- 11 years since the implementation of a circuit non-mydriatic retinal camera (NMRC) in a Primary Care Center, where trained general practitioners (GP) assume more responsibility in screening for DR.
- The number of patients with type 2 diabetes mellitus (DM2) screened.
- The diagnosis of DR and its early management.

Design and method: Cross-sectional observational study between 2007 and 2017 of diabetic patients screened in an NMRC.

Variables: diabetic patients screened/year, DR, consultation with the referring ophthalmologist and hospital referral.

Results: In 2007, 6,537 individuals over 14 years old were diagnosed with DM2 and 5,230 of them had never received any type of screening for DR.

Year	Diabetic patients screened	First screening	DR	Consultation with referring ophthalmologist	Hospital referral
2007	1,631	-	36	313	113
2008	2,090	-	148	358	127
2009	2,655	1,251 (47.1%)	140	377	103
2010	2,948	1,060 (36%)	151	434	53
2011	2,424	667 (27.5%)	114	294	41
2012	3,657	-	210	409	66
2013	2,926	712 (24.3%)	189	347	82
2014	3,522	875 (24.8%)	158	398	91

2015	3,418	754 (22.1%)	121	306	51
2016	3,307	637 (19.2%)	109	296	42
2017	3,014	655 (21.7%)	86	198	43

About 20% of patients screened annually were screened for the first time.

Conclusions: The inclusion of GPs trained in an agreed-upon NMRC circuit in Primary Care in order to screen for DR allows for better monitoring of diabetic patients and optimizes interdisciplinary circuits.

We must question whether regions with an adequate level of screening will be able to withstand the expected increase in the prevalence of DM and the expected occurrence of new cases of DR that would be added to the current diabetic population that should be periodically screened.

This situation can lead to a further worsening of DR cases where the case burden had already improved thanks to the established circuits.

Obstructive sleep apnea risk assessment among type 2 diabetes population in Primary Care

Jonathan Silva[1], Mário Sampaio[1]

[1] USF Balsa

Aim(s) or purpose: Obstructive sleep apnea (OSA) is highly prevalent in the general population and occurs at all ages. OSA is characterized by a collapse of upper airways during sleep with ineffective respiratory efforts, intermittent hypoxia, and sleep disruption. Multiple cross-sectional studies have shown a high prevalence of undiagnosed OSA in patients with type 2 diabetes. Untreated OSA in diabetic patients is associated with an increased prevalence of neuropathy, peripheral arterial disease, diabetic retinopathy, and diabetic nephropathy. Screening for OSA in diabetic patients should be conducted systematically since CPAP treatment for at least 4 h/night may be protective.

This study aimed to evaluate the prevalence of high risk of undiagnosed OSA among patients with type 2 diabetes in Primary Care (PC) settings who should be referred for diagnostic evaluation.

Design and method: An observational, analytical, and cross-sectional study was carried out on a sample of patients from a primary healthcare centre who came for a doctor's visit for a type 2 diabetes follow-up medical appointment, between April and September 2019. Sociodemographic and clinical data were collected through a structured interview and from medical records. The risk of undiagnosed OSA was evaluated using the STOP-BANG questionnaire.

Results: 92 patients were included in the study. The age was 69.56 ± 12 years, 56.52% were male patients, with a neck circumference of 38.46 ± 5.18 cm and BMI of 29.43 ± 5 kg/m^2. The prevalence of a high risk of OSA (STOP-BANG score ≥ 3) was 79.35%.

Conclusions: There is a high prevalence of risk for undiagnosed OSA in the sample analysed. OSA might be considered a modifiable risk factor for type 2 diabetes development and adverse outcomes in these patients. PC has a key role in early detection and facilitating diagnosis. The STOP-BANG questionnaire is an interesting triage tool for the primary healthcare setting, selecting those with probable OSA for diagnostic evaluation and predicting patients with a more severe disorder as well as those who need faster treatment.

Peyronie's disease is related to diabetes in the Saharawi Refugee Camps of Tindouf (Algeria)

Enrique Carretero[1], David León[1], Laura Romera[2]

[1] Andalusian Health Service, [2] Institut Català de la Salut

Aim(s) or purpose: The estimated prevalence of Peyronie's disease (PD) in the general population ranges from 0.5% to 20%. The prevalence may increase further in certain sub-populations, as in type 2 diabetes mellitus (T2DM) patients. In addition, PD has a relevant association with obesity. Both comorbidities, T2DM

and obesity, are significantly present among Saharawi population of Tindouf Refugee Camps (Algeria), so the researchers expected a high prevalence of PD due to a combination of several risk factors.

Design and method: Descriptive cross-sectional study, 1) to evaluate the prevalence of PD in the population of Saharawi Refugee Camps, and 2) to identify the main determinants in the onset of PD in that population. Over 2 years of follow-up (2016-2018) in three Primary healthcare centers at the Saharawi Refugee Camps of Tindouf, 1,013 male patients, age from 20 to 90 years, were recruited.

Results: From this population-based study, 329 male patients presented T2DM (table 1). Having this condition resulted in a significant association with PD ($p < 0.0001$), an odds ratio (OR) of 6.32 (4.03-9.92, 95% CI). Study participants were over 6 times more likely to have PD.

Conclusions: The Saharawi population in the Refugee Camps of Tindouf (Algeria) presented a high T2DM related to a substantial number of cases of PD. As such, developing screening programs could help to improve metabolic control, prevent the onset of T2DM, and promote an early detection of this condition in order to have a positive impact on PD.

Prevalence of comorbidities in T2DM patients at the Saharawi Refugee Camps

Enrique Carretero[1], David León[1], Laura Romera[2]

[1] Andalusian Health Service, [2] Institut Català de la Salut

Aim(s) or purpose: There is a high prevalence of type 2 diabetes mellitus (T2DM) in the Saharawi population in the Tindouf Refugee Camps (Algeria). High rates of comorbidities are suspected. The aim of this study was to describe the prevalence of comorbidities of T2DM patients at the Saharawi Refugee Camps.

Design and method: An observational, descriptive, transversal, multicenter study was performed at the Refugee Camps.

The program was conducted during three periods over two years (2016-2018). The population sample was collected at the local clinics in the camps.

In total 2,522 patients ranging in age from 20 to 90 years old were recruited: 1,013 were male (40.2%) and 1,509 were female (59.8%).

The variables recorded were age, T2DM, HbA1c, body mass index, blood pressure, cardiovascular disease, dyslipidemia, depression, and smoking.

Results: A high prevalence of T2DM was detected with 910 (36.09%) patients: 329 (36.2%) male and 581 (63.8%) female. The median age was similar in both genders: 68.05±1 years. In this T2DM population, 121 (36.7%) men and 262 (45.1%) women had poor control (HbA1c >8%). The most frequently observed comorbidity was obesity (n = 337; 37%) and being overweight (n = 236; 25.9%), followed by hypertension (n = 273; 30%), dyslipidemia (DLP) (n = 90; 9.8%), cardiovascular disease (n = 77; 8.4%) and depression (n = 28; 3.1%).

The HbA1c mean among T2DM patients was 8.7 ±3.7%: the HbA1c mean was significantly higher among women than men (9.4 ±1.4 vs. 8.0 ±5.2; $p < 0.01$); the mean BMI was 34 ± 0.1 kg/m2, with women showing significantly higher values (37 ± 8.7 kg/m2) than men (32 ±7.0 kg/m2; $p < 0.01$).

The prevalence of smoking was higher among men (n = 156; 47.4%) compared to women, who were less likely to smoke.

Conclusions: Compared to men, the prevalence of T2DM, like worse metabolic control, was significantly higher in women.

The comorbidity profile was remarkably different: women presented a higher prevalence of obesity and being overweight, while men with same condition showed higher figures in terms of cardiovascular disease and smoking.

Profiles of type 2 diabetes mellitus patients over 65 years old according to different parameters of renal disfunction. ESCADIAN study

Ana Cebrián-Cuenca[1], Josep Franch-Nadal[2], Domingo Orozco-Beltrán[3], José Millaruelo-Trillo[4]

[1] Cartagena Casco Primary Care Center, [2] Raval Sud Primary Care Center, [3] Research Unit Cabo Huertas Primary Care Center, [4] Torrero-La Paz Primary Care Center

Aim(s) or purpose: To analyze the characteristics associated with eGFR impairment with normal ACR or ACR impairment with normal eGFR in type 2 diabetes mellitus (T2DM) patients older than 65 years.

Design and method: Observational, cross-sectional, multicentred, nationwide study. Patients with known T2DM, aged 65 or older, treated in Primary Care Centers were included. Demographic, anthropometric, and analytical variables were collected from the last 12 months, including the ACR and eGFR to assess renal function.

Results: 608 patients were included. Abnormal eGFR with normal ACR is significantly associated with older age (79.7 vs. 76.3), is more prevalent among women (64% vs. 31%), is associated with a higher frequency of severe hypoglycemia (30.8% vs. 12.5%), with higher levels of triglycerides (156 vs. 129 mg/dl) and with more use of ACE inhibitors (ACEi) or angiotensin receptor blockers (ARB) (81.6 vs. 69%), loop diuretics (36 vs. 16.9%) and beta blockers (30.7 vs. 16.9%). Elevated ACR with normal eGFR is significantly associated with more complications of T2DM (22.5 vs. 13.3%), more ischemic heart disease (19.7 vs. 10.6%), proliferative retinopathy (4.2 vs. 2.7%), higher systolic blood pressure (137 vs 135 mmHg) and diastolic blood pressure (75.5 vs. 71.3 mmHg), increased use of anticoagulants (19.7 vs. 14%) and dihydropyridine calcium channel blocker (CCB) (47.9 vs. 25.4%).

Conclusions: In T2DM patients 65 or older, abnormal eGFR with normal ACR is associated with women, with a higher prescription of ACE inhibitors (ACEi) or angiotensin receptor blockers (ARB), beta blockers and diuretics. Patients with altered ACR and normal eGFR are associated with men with higher cardiovascular risk with higher blood pressure levels, increased use of dihydropyridine calcium channel blocker (CCB) and anticoagulants and more complications of diabetes.

Quality of life among patients with type 2 diabetes mellitus in Tetovo, North Macedonia

Bekim Ismaili[1], Nevzat Elezi[1], Ylber Besimi[1], Rihan Saiti[1]

[1] University of Tetovo

Aim(s) or purpose: Diabetes as an entity is considered a clinical problem. Thus, the impact of diabetes on quality of life, in functional and economic terms, has not been addressed. The main aim of this study is to measure the impact of diabetes control on quality of life (QOL).

Design and method: A cross-sectional transverse study was performed on 373 patients with Type 2 Diabetes Mellitus (T2DM), in permanent residents of Tetovo and the surrounding area. QOL was evaluated using the Diabetes-39 (D-39) questionnaire.

Results: After analyzing each answer for the 5 domains of the D-39 questionnaire, the results obtained from 1 = not affected at all to 7 = affected a lot, the QOL scores were transformed on a scale from 0 - 100. The QOL as a whole was 55.8 ± 20.2 with min/max of 0/100 and 50% of the surveyed patients with a result over 50% for the Median IQR = 50 (50-66.7). The "Anxiety and worrying" domain had the highest score with an average of 56.4 and 50% with the D-39 score above 58.3. Next came the "Energy and mobility" and "Diabetes control" domains, with a result of 52.9 and 52.4 respectively. The domains "Social burden" with 38.6 and "Sexual behavior" with a result of 33.1 were less affected. Significant risk factors that correlated with a low QOL were: female gender, ethnicity - non-Albanian, level of education, physical inactivity, duration of the disease, insulin therapy and presence of comorbidities.

Conclusions: T2DM significantly affects patients' QOL. The greater the number of comorbidities the lower the QOL score. The highest score was recorded in the "Anxiety and worrying" domain. Females had a worse QOL than males for each of the five D-39 domains. The presence of any comorbidity significantly lowered the chance of having a good QOL by 33.6%.

Real-world use of once-weekly semaglutide in patients with type 2 diabetes: study design and baseline characteristics of SURE Canada and Switzerland

Ulrik Bodholdt[1], Andrei-Mircea Catarig[2], Katrine Grau[1], Gottfried Rudofsky[3], Trine Stougaard[2], Jean-Francois Yale[4]

[1] Speciallæge, I Almen medicin, [2] Novo Nordisk A/S, [3] Kantonsspital Olten, Baslerstrasse, [4] McGill University Health Centre

Aim(s) or purpose: Once-weekly (OW) subcutaneous semaglutide is a glucagon-like peptide-1 receptor agonist (GLP-1RA) approved for T2D. In the SUSTAIN phase 3 clinical trials, significantly greater reductions in HbA1c and body weight (BW) were seen with semaglutide vs comparators. The SURE real-world studies are intended to complement the SUSTAIN trials and provide evidence for OW semaglutide use in a real-world setting. Here, we describe the study design and baseline characteristics of SURE Canada (CA; NCT03457012) and Switzerland (CH; NCT03631186).

Design and method: The multicentre, prospective, non-interventional SURE studies are investigating patients initiating OW semaglutide in real-world practice, regardless of concomitant T2D medication(s). Adults with T2D and HbA1c documented ≤12 weeks before semaglutide initiation were enrolled. The primary endpoint was the change in HbA1c from baseline to ~30 weeks. The secondary endpoints include change in BW, waist circumference and patient-reported outcomes.

Results: In total, 449 (178 females and 271 males) patients initiated semaglutide in CA and 211 (82 females and 129 males) in CH. At baseline, mean age: 59.7 (CA) and 60.5 years (CH); diabetes duration: 14.6 (CA) and 11.0 years (CH); HbA1c: 8.1% (CA) and 7.8% (CH); BMI was 34.6 kg/m2 in both countries. Proportion of patients treated with a GLP-1RA at baseline was 27.2% in CA and 22.3% in CH. In CA and CH, 20.0% and 17.5% had coronary heart disease, respectively. In CA and CH, 89.1% and 69.7% of subjects initiated semaglutide to improve glycaemic control, and 80.2% and 84.8% for weight reduction although it is primarily prescribed for lowering glucose.

Conclusions: In the SURE real-world studies, patients initiating OW semaglutide, on average, had a high BMI, had T2D for more than 10 years and had an HbA1c level above target, all of which justified intensification of therapy with semaglutide.

Relationship between serum vitamin D concentration and the body mass index in patients with type 2 diabetes

Ivan Pankiv[1]

[1] Bukovinian State Medical University

Aim(s) or purpose: The aim of the study was to investigate the vitamin D status in patients with type 2 diabetes mellitus (DM) and establish the association between serum 25(OH)D level and body mass index (BMI).

Design and method: For this observational study, data were collected during the summer 2019 over a period of one week from five township areas in the Carpathian region (Ukraine) from 716 type 2 diabetic patients aged 32–79 years. The variables measured contained 25(OH)D level, weight and weight applied to check the level of BMI. The average level of vitamin D among adolescents was 21.2 ± 6.4 ng/ml. The female gender was associated with lower vitamin D concentrations (19.3 ± 5.9 ng/ml vs. 24.1 ± 7.1 ng/ml for men). Among participants, 74.3% had a BMI of 25 kg/m^2 or more, and in 26.9% of them the number was 30 kg/m^2 or more.

Results: A high frequency of being overweight or obese was detected in the observed participants. 83.3% of individuals were overweight or obese according to BMI, especially the women. Vitamin D status deficiency was detected in 88.1% of persons. 2.1% of the people had been identified as severely vitamin D deficient. The measurement of 25(OH)D demonstrated a significant relationship between the vitamin D level and BMI only among persons who were overweight (BMI 25-29.9 kg/m^2). The average vitamin D concentrations in persons with a BMI over 30 kg/m2 did not vary to a significant range from data in persons with a normal body weight. There were significant inverse correlations between the serum 25(OH)D concentrations and mass of body fat ($r = -0.317$, $P = 0.001$), and parathyroid hormone (PTH) concentrations ($r = -0.314$, $p = 0.003$).

A significant positive correlation was observed between changes in serum PTH concentrations and mass of body fat (r = 0.34, p = 0.002), while there were no significant correlations between the serum 25(OH)D concentrations and mass of body fat or PTH concentrations.

Conclusions: Our results confirm a reliable relationship between vitamin D level and BMI among type 2 diabetic patients who are overweight.

Relative risk and prevalence of multi-nodular goiter in euthyroid diabetic subjects

Analisa Vetri[1], Cristiano Crisafulli[1], Massimo Catanuso[1], Manuela Nicotra[1], Antonino Di Guardo[1]

[1] Italian College of General Practitioners.

Aim(s) or purpose: The association between diabetes (DM) and thyroid disease has been shown. Many works, evaluated the correlation between DM, hypothyroidism, and hyperthyroidism, but only a few works have highlighted the correlation between goiters and DM. The aim of our work was to evaluate statistically significant differences between DM patients and a control group in the prevalence of goiters.

Design and method: We enrolled 180 diabetic and 180 non-diabetic subjects who had requested a thyroid ultrasound. The diameters and characteristics of the thyroid were assessed such as echogenicity, nodules, and vascularization pattern. All subjects underwent blood tests for thyroid hormones, lipids, and anthropometric evaluation. We evaluated the prevalence of multinodular goiters among diabetic subjects and compared it with non-diabetic subjects. All data were statistically evaluated with the chi-squared test and T test.

Results: The prevalence of goiters in diabetic subjects was three times higher than the control group and diabetic subjects have an odds ratio of 2.93% of developing a goiter (p = 0.0020). We found statistically significant differences for: Age, TSH, anteroposterior diameter, total number of nodules and BMI. We also divided the diabetic subjects into two groups based on the anteroposterior diameter and found statistically significant differences for: TSH, number of nodules, and BMI.

Conclusions: Although with a limited number of cases, our study underlines how general medicine is important at an early stage of screening in order to pay attention in diabetic subjects to the possible onset of thyroid disease. It could therefore be useful to subject adult patients with DM to first level ultrasound screening of the thyroid gland to carry out an early diagnosis of the diseases affecting this gland. In fact, in our study, diabetic patients have a higher multinodular goiter prevalence than healthy subjects. This volumetric increase in the gland is independent of the other characteristics under examination so it could be attributed to circulating insulin levels mediated by insulin resistance.

Results of the addition of a sulfonylurea, DPP4 inhibitors or SGLT2 inhibitors as a second-line drug to metformin in subjects with type 2 diabetes and insufficient glycemic control

Manel Mata[1,2], Dídac Mauricio[1,2,3], Josep Franch[1,2], Xavier Mundet[1,4], Jordi Real[1,2], Bogdan Vlacho[1]

[1] DAPCat group, Unitat de Suport a la Recerca Barcelona, Fundació Institut Universitari per a la recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol), [2] CIBER of Diabetes and Associated Metabolic Diseases (CIBERDEM), Instituto de Salud Carlos III (ISCIII), [3] Department of Endocrinology and Nutrition, Hospital Universitari de la Santa Creu i Sant Pau, Universitat Autònoma de Barcelona, [4] Department of Medicine, Universitat Autònoma de Barcelona

Aim(s) or purpose: To compare the proportion of subjects achieving the combined reduction of HbA1c of at least 0.5% and weight of at least 3% after the addition of a sulfonylurea (SU), a DPP-4i or an SGLT-2i as second-line add-on to metformin in patients with type 2 diabetes (T2D) and insufficient glycemic control (HbA1c>7%).

Design and method: This was a retrospective cohort study. The subjects included were matched by propensity score according to the baseline age, sex, HbA1c, weight, inclusion date, diabetes duration, and kidney function. Changes in weight, HbA1c, blood pressure, and lipids after intensification were assessed. We used the Primary Care SIDIAP database containing electronic medical records. The observational period was until December 31, 2017.

Results: After matching, 6,310 subjects were compared, 2,062 for SU, 2,124 for DPP-4i and 2,124 for SGLT-2i. The proportion of patients who achieved combined target HbA1c (>0.5%) and weight (3%) reductions after the addition of SU, DPP-4i or SGLT-2i was: 17.6%, 24.2%, and 36.1%, respectively. The mean absolute HbA1c reduction was: 1.27% for SU, 1.35% for DPP4i and 1.21% for SGLT2i. The mean weight reduction was: 0.56 kg for SU, 1.38 kg for DPP4i and 3.1 kg for SGLT2i. Small differences in systolic blood pressure reduction (-1.00 mmHg, -1.06 and -2.07, respectively) were observed in favour of SGLT-2i. Concerning lipids, we observed small differences, with an HDL-cholesterol increase with SGLT-2i, a greater total and LDL-cholesterol decrease with DPP4i and SU, and greater triglyceride decrease with SGLT-2i and SU.

Conclusions: Our real-world data show similar hypoglycemic effectiveness after the addition of SU, DPP-4i or SGLT-2i to metformin. Greater reduction in weight and blood pressure was observed among SGLT-2i patients. The effect on the main composite outcome with SGLT-2i is mainly attributable to a greater weight reduction.

Self-care practices and barriers in patients with diabetes mellitus in North Batinah, sultanate of Oman

Firdous Jahan[1]

[1] College of Medicine and Health Sciences National University

Aim(s) or purpose: The purpose of this study was to identify knowledge, attitude, and barriers to self-care in diabetic patients at the primary health care center. The prevalence of diabetes is rapidly increasing in Oman similar to other regions in the world. Self-care can improve diabetic control as well as delay complications and is also important to reduce the cost for diabetic check-ups. Self-care includes regular exercise, following a recommended diet, proper intake of prescribed medications, and blood glucose monitoring.

Design and method: A cross sectional survey-based study was carried out in the Sohar Polyclinic, in the North Batinah region in Oman. Data was collected on a self-administered questionnaire in which the core elements were divided into demographics, clinical characteristics, diabetes self-care, knowledge, attitude, and barriers to self-care. The statistical analysis was performed using SPSS (IBM SPSS Statistics 20.0). The data was expressed in frequencies, mean and percentages.

Results: Eighty-three patients participated, of which one fourth of study participants were less than 40 years and 42.2% were male. The mean HbA1c value was 8.3% with the range of 5.34-13.54%. The majority of the study participants were Type 2 diabetics (95.2%) and more than half (59%) were on oral hypoglycemic drugs. The results showed a high proportion of diabetic retinopathy (43.4%) as compared to neuropathy (21.7%), nephropathy (13.3%) and vasculopathy (18.1%). No significant statistical difference was observed between male and female responses involving diabetic's knowledge of diabetes self-care, perception, and barriers to good glycemic control.

Conclusions: The study results concluded that there is a need to provide education on diabetes self-care, awareness and after-effects of risk factors for diabetes among the population.

Self-efficacy in people with type 2 diabetes mellitus: A pilot study

Senem Aslan[1]*, Sabah Tüzün*[2]*, Pınar Topsever*[3]

[1] Pendik-Esenyali Family Health Center, [2] Dr. Lütfi Kırdar Training and Research Hospital Department of Family Medicine, [3] Acıbadem University

Aim(s) or purpose: The prevalence of diabetes mellitus (T2DM) has been gradually increasing all over the world. Self-management is important for the success of treating diabetes mellitus. The aim of this study is to evaluate self-efficacy of people with T2DM, who visit primary healthcare centers in Esenyali, in the Pendik region of İstanbul

Design and method: This cross-sectional study will include T2DM patients age 18 years and older visiting family health centers in Esenyali, Pendik, Istanbul between June 1, 2020 and June 1, 2021. A questionnaire

prepared by the researchers, including sociodemographic variables such as age, gender, education level, the duration of DM, antidiabetic treatments used, other diseases, medication used, height, weight, waist circumference and the "Diabetes Self-Efficacy Scale" (DSS) are planned to be applied to all participants. The DSS is a questionnaire consisting of 8 Likert items, (scored from 1 "not at all confident" to 10 "totally confident") the Turkish version of which is valid and reliable. In Esenyalı, Pendik there are 10 family health centers, with approximately 4000 patients registered in each family health unit. The prevalence of DM in Turkey was reported to be 13.7%, thus, the scope of the study was calculated 5480 patients for the Pendik region. A representative single sample size was calculated with 80% power, 95% confidence interval and a 5% margin of error and 5% data loss as 378 T2DM patients. The study plans to randomly select 38 patients from a random family heath unit from each family health center. İlliterate patients will be excluded from the study.

Results: This study is still in the planning stage

Conclusions: This study is still the planning stage. We do not have the results yet.

Similar efficacy and gastrointestinal tolerability versus exposure for oral and subcutaneous semaglutide

Christin Løth Hertz[1], Rune Viig Overgaard[1], Andrea Navarria[1], Steen Hvass Ingwersen[1]

[1] Novo Nordisk A/S

Aim(s) or purpose: The lower bioavailability of oral semaglutide results in more variable plasma concentrations versus subcutaneous administration. Using populations from the SUSTAIN and PIONEER trials, we investigated if oral administration affects the efficacy and tolerability of semaglutide.

Design and method: Population pharmacokinetic and exposure–response (ER) analyses were based on average semaglutide steady-state concentrations. The response data came from four trials (SUSTAIN 1, 2, 3, SUSTAIN-Japan) of once-weekly subcutaneous semaglutide 0.5 mg and 1.0 mg over 30 weeks (n = 1552), and six trials (PIONEER 1, 2, 3, 5, 8, 9) of once-daily oral semaglutide 3 mg, 7 mg or 14 mg over 26 weeks (n = 3003). Graphical and model-based techniques were used to investigate ER relationships for changes from baseline in glycated haemoglobin (HbA1c) and body weight, and the proportions of subjects reporting nausea or vomiting.

Results: Pharmacokinetics were dose-proportional and body weight was the main covariate for exposure for both subcutaneous and oral semaglutide. ER analyses showed greater HbA1c and weight reductions, and more subjects reporting nausea/vomiting with increasing exposure. The main covariate for glycaemic effect was the baseline HbA1c (larger HbA1c reductions with higher baseline HbA1c values). The exposure range was wider for oral semaglutide than subcutaneous dosing, but there was considerable overlap between oral semaglutide 7 mg and 14 mg and subcutaneous semaglutide 0.5 mg and 1.0 mg, indicating similar exposures across formulations. The ER relationships were similar in SUSTAIN and PIONEER.

Conclusions: Similar ER relationships were observed for the efficacy and tolerability of semaglutide, regardless of the administration route, indicating that the greater variability in plasma concentrations with oral semaglutide does not impact the response. Presented at EASD, September 2019.

Stealth Killer

Ana Ramos[2], Rubén Pérez[1], Beatriz Martín[3]

[1] Covaresa Health Center, [2] Parquesol Health Center, [3] Río Hortega Hospital

Aim(s) or purpose: Hyperglycaemia is a very common finding in Emergency Departments. Although we associate this sign with Diabetes Mellitus, it is not uncommon in newly diagnosed patients. It is important to determine capillary blood glucose levels in patients with diabetes mellitus, but also in those with symptoms compatible with increased or decreased blood glucose levels.

Design and method: An 86-year-old hospitalised woman, independent for daily life activities. History of

medullary thyroid carcinoma, high blood pressure, and right knee arthroplasty. Current treatment with prednisone 30 mg every 12 hours for the last 6 months, bemiparin 3500 U every 24 hours, deltius, ranitidine, and enalapril.

Referral to the Emergency Department due to myoclonus in the upper right extremity accompanied by a decrease in the level of consciousness after hours of evolution. Computerised tomography (CT scan) and blood analysis were requested.

The brain-CT scan: signs of brain swelling without any other significant findings. The analysis showed capillary glycaemia of 1215 mg/dl and plasma osmolarity of 367 mOsm/kg. Intravenous insulin treatment was initiated. Family members were interviewed, and a history of diabetes mellitus was investigated. No data on diabetes mellitus were found and the last blood test from only one week prior showed blood glucose figures of 123 mg/dl.

Results: Hyperosmolar coma with secondary brain herniation.

Conclusions: The incidence of hyperglycaemic hyperosmolar syndrome is estimated to be about 1% of the hospitalisations of patients with diabetes. The diagnostic criteria recommended by the American Diabetes Association (ADA) are blood glucose above 600 mg/dl, plasma osmolarity above 320 mOsm/kg and the absence of significant ketoacidosis. One of the worst complications is cerebral oedema, which causes a rapid deterioration of the general state and can lead to convulsions, bradycardia, and respiratory arrest. It is therefore important to always bear in mind the clinical manifestations produced by hyperglycaemia, including the determination of capillary glycaemia upon arrival at the Hospital Emergency Department.

Subclinical atherosclerotic disease and prediabetes in the Mollerussa Cohort Study

Maria Belén Vilanova[1], Mireia Falguera[2], Silvia Canivell[3,4], Esmeralda Castelblanco[4,5], Josep Franch-Nadal[4,6], Dídac Mauricio[5]

[1] Primary Health Care Centre Igualada Nord. Consorci Sanitari Anoia, [2] Primary Health Care Centre Cervera. Institut Català de la Salut, [3] Primary Health Care Centre Sant Martí de Provençals. Institut Català de la Salut, [4] DAP-Cat Group, Unitat de Suport a la Recerca Barcelona, Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol) & CIBER on Diabetes and Associated Metabolic Diseases (CIBERDEM), [5] Department of Endocrinology & Nutrition, Hospital de la Santa Creu i Sant Pau & Institut d'Investigació Biomédica Sant Pau (IIB Sant Pau), & CIBER on Diabetes and Associated Metabolic Diseases (CIBERDEM), [6] Primary Health Care Centre Raval Sud. Institut Català de la Salut

Aim(s) or purpose: We aimed to compare the burden of subclinical atherosclerosis as measured by carotid ultrasonography in a cohort of subjects from a Mediterranean population with prediabetes vs. subjects with normal glucose tolerance (NGT).

Design and method: The Mollerussa Cohort Study was a prospective, observational study conducted in subjects aged ≥25 years randomly selected from the general population who had prediabetes, defined as FPG between 100 mg/dL and <126 mg/dL and/or HbA1c between 5.7% and <6.5%. The burden of atherosclerosis was assessed through carotid ultrasonography to measure carotid intima-media thickness (c-IMT), the presence/absence of carotid plaques, and the number of plaques. We also investigated clinical factors predicting the presence of subclinical atherosclerosis.

Results: Among the 550 subjects included (58.4% women, mean age 50.1 years, mean BMI of 26.1 kg/m2), there were 224 (40.7%) subjects with prediabetes. The mean c-IMT was significantly higher in the prediabetes group compared to the NGT group (0.72 vs. 0.67, p<0.001). The prevalence of carotid plaque was higher in the prediabetic group than in the NGT group (37.9% vs. 19.6%; p<0.001), as was the proportion of subjects with one or multiple plaques (19.6% and 18.3 vs. 10.1% and 9.5%, respectively; p<0.001). Older age, male gender, and increased systolic blood pressure, but not prediabetes or LDL-c, were positively correlated with c-IMT and were independent predictors of the presence of plaques. In contrast, prediabetes and LDL-c were predictors of the presence of carotid plaque (OR = 1.64; 95% CI = 1.05-2.57; p = 0.03 and OR = 1.64; 95% CI = 1.05-2.57; p = 0.03, respectively) together with exposure to tobacco and leukocyte count (p = 0.023 and p = 0.008, respectively).

Conclusions: Prediabetes was associated with established subclinical carotid atherosclerosis. These results suggest that hyperglycemia is involved in the initial stages of atherosclerosis development. Our findings could have implications for the prevention and treatment of cardiovascular disease in subjects with prediabetes.

Switching between GLP-1 receptor agonists: an expert consensus and practical guide

Tina Vilsbøll[1], Akshay Jain[2]

[1] Steno Diabetes Center Copenhagen, Gentofte Hospital, University of Copenhagen, [2] Fraser River Endocrinology

Aim(s) or purpose: Several glucagon-like peptide-1 receptor agonists (GLP-1RAs) are available for treating type 2 diabetes (T2D). Differences in pharmacokinetics, dosing regimens and clinical effects, including cardiovascular (CV) outcomes, mean there may be benefits to switching from one GLP-1RA to another. However, clinical guidance on switching is lacking, with limited data from clinical studies.

Design and method: Perspectives were provided by 10 healthcare professionals with experience switching patients with T2D to once-weekly (OW) semaglutide from another GLP-1RA were collated, with the aim of providing guidance.

Results: Factors identified as medical triggers for switching to another GLP-1RA have included insufficient improvement in, or worsening of, glycaemic control; desire for additional body weight loss (some GLP-1RAs, e.g. OW semaglutide, have greater impact on HbA1c and body weight than others); poor adherence (switching from once- or twice-daily GLP-1RA to OW); potential for CV benefit (switching to semaglutide, liraglutide or dulaglutide); and side effects with current GLP-1RA. Switching should be individualised, based on considerations including treatment duration with (and dose of) previous GLP-1RA, the patient's experience initiating the prior GLP-1RA, any concomitant treatment, and clinical characteristics. Switching to OW semaglutide has been observed to provide meaningful clinical benefits. The transient gastrointestinal adverse events that may (re)occur when switching to another GLP-1RA can be reduced by slow uptitration and advising patients to reduce food portion sizes and fat intake.

Conclusions: The switching approach should be individualised. Switching from one GLP-1RA to another, such as OW semaglutide, can provide substantial clinical benefits and may delay treatment intensification. Practical guidance to support clinicians in such switching will be presented.

The experience of patients with type 2 diabetes mellitus (T2DM) with the Spanish healthcare system. A survey with the IEXPAC Scale in Primary Care Department, Cartagena, Spain

Ana Cebrián-Cuenca[1], Alberto Barragán Pérez[2], Isabel Ivañez Sirvent[3], José Borrachero Guijarro[4], Pilar García Gómez[3], Magdalena Soto Martinez[4]

[1] Cartagena Casco Primary Care Center Área de Salud [2]. Servicio Murciano de Salud, [2] Primary Care Center Coordinator. Área de Salud [2]. Servicio Murciano de Salud, [3] Continuity of care Área de Salud [2]. Servicio Murciano de Salud, [4] Barrioperal Primary Care Center Área de Salud [2]. Servicio Murciano de Salud

Aim(s) or purpose: To assess the experience of type 2 diabetes mellitus patients (T2DM) with the healthcare system to identify patients perceived healthcare gaps, opportunities for improvement and patient engagement with healthcare team.

Design and method: Scope: 16 Primary care centers. Target: patients>16 years old with T2DM who were treated by Primary Care professionals in May 2019. Cross-sectional survey. Sample size: 378 patients responded to the self-administered questionnaire: Evaluating the Experience of Patients with a Chronic Disease (IEXPAC). IEXPAC is structured into 11 items associated with the best patients experience practices, plus another additional 4 items (number of medications, use of emergencies and hospitalizations, home care and use of social services). For the statistical analysis we used bivariant comparisons.

Results: 373 (98.7%) patients answered the questionnaire. Mean age 65.3 years, 53.3% were men. On a scale from 1 to 10, the mean+/-standard deviation punctuation was 7.42 +/- 1.4. The highest scores refer to the activities of the care process ("they respect my lifestyle"; "we set goals for a healthy life and to better control my illness"; "they make sure that I take my medication correctly"). The lowest scores were obtained in the use of mobile devices and internet to consult information regarding the disease, to coordinate with social and health services, and for social interaction with other patients.

Conclusions: Patient experience is acknowledged as a principal aspect of quality of care and it is directly related to achieving positive outcomes. IEXPAC is the first Spanish questionnaire that it is validated to evaluate patients experience in the health care system. This is a tool that could identify the best and the worst patient experiences in order to offer them the best quality of health care.

The impact of anxiety, depression, and sleep disorders on the expression of obesity

Taisiia Bagro[1], Victoria Tkachenko[1]

[1] Department of Family Medicine, Shupyk National Healthcare University of Ukraine

Aim(s) or purpose: To determine the that impact anxiety, depression, and sleep disorders have on the expression of obesity.

Design and method: 75 patients with a body mass index of 30-40 kg/m^2, aged 39.03±0.93 years (39 women and 36 men) were studied. The level of anxiety and depression was assessed using the HADS hospital scale, Beck's scale, the Hamilton scale (HAM-A), daytime sleepiness - using the Epworth Sleepiness Scale (ESS), sleep quality - using the Pittsburgh Sleep Quality Index (PSQI). The statistical analysis was performed with IBM SPSS Statistics, Statistica 12, and Excel 2010.

Results: The clinically expressed level of anxiety ($HADS_{anxiety}$ = 10.15±0.54, HAM-A = 11.76±0.58) and depression ($HADS_{depression}$ = 12.04±0.57, Beck's scale = 13.12±0.80) was determined in obese patients. The level of anxiety had a strong correlation with the scores of sleep disorders (PSQI with $HADS_{anxiety}$ r = 0.64, HAM-A r = 0.67; ESS with $HADS_{anxiety}$ r = 0.65; HAM-A r = 0.68), as well as the level of depression (PSQI with $HADS_{depression}$ r = 0.77, Beck's scales r = 0.76; ESS with $HADS_{depression}$ r = 0.78; Beck's scales r = 0.75). Anxiety and depression correlated with BMI ($HADS_{anxiety}$ r = 0.54, HAM-A r = 0.54; $HADS_{depression}$ r = 0.64; Beck's scales r = 0.73).

Conclusions: The clinically expressed anxiety and depression were determined in obese patients, which correlated with BMI, excessive levels of sleepiness and poor sleep quality. The results are important for choosing a patient-oriented approach for the treatment of obese patients.

The prevalence of chronic diseases among patients with type two diabetes - mellitus in King Abdulaziz National Guard Hospital, Al Ahsa

Mansoor AlNaim[1]

[1] King Abdulaziz National Guard Hospital

Aim(s) or purpose: The main aim of this study is to investigate the prevalence of chronic diseases among patients with type two diabetes mellitus in the National Guard Hospital, Al Ahsa.

Design and method: A retrospective cross-sectional study was conducted on patients who were diagnosed with type II DM and were regularly attended to at the family medicine clinic at the National Guard Hospital, Al Ahsa, Saudi Arabia.

Results: 300 type two diabetic patients with different chronic diseases were randomly selected. There was a statistically significant association between the HbA1C level, and the type of treatment received by our population, but the fasting blood glucose level was not significant. Regarding the TSH level, out of 300 patients, 9.5% were diagnosed with a normal TSH level and 90.5% were diagnosed with an abnormal TSH level. One hundred thirty-five patients had hypertension with Dyslipidemia and the rest of the patients had other comorbidities. Vitamin D level deficiency was observed in the majority of patients while vitamin D insufficiency was observed in some patients.

Conclusions: In our population, the prevalence of female diabetic patients with chronic diseases was 1.8 times higher than the prevalence of diabetic male patients. The prevalence of abnormal diagnosed levels of TSH was 9.5 times higher than normal levels.

The effect of adherence to therapy and health plans in achieving diabetes control - among diabetic patients at King Abdulaziz National Guard Hospital, Al Ahsa: A - retrospective study

Mansoor AlNaim[1]

[1] King Abdulaziz National Guard Hospital

Aim(s) or purpose: To assess the effect of adherence to therapy and health plans in achieving diabetes control among people with diabetes at King Abdulaziz National Guard Hospital, Al Ahsa.

Design and method: A retrospective study was conducted among diabetic patients who received care at an outpatient clinic. Patients were identified through the hospital medical records over a one-year period. The estimated population size was around 2,000 patients and 322 patients were selected by a systematic sampling method. Medical charts were reviewed, the data were collected in a specially designed data sheet, entered into a computer, and finally analyzed using SPSS.

Results: About 90% of patients were older than 40 years old and 92.2% were overweight or obese. The overall glycemic control as evaluated by HbA1C was acceptable in about 22.4% of the patients. More than half of the patients were on a diet and oral hypoglycemic therapy and 94.7% were taking more than 3 drugs. About 44.7% of patients had hypertension and hyperlipidemia. The frequency of monitoring HgA1C level within one year was three times in the majority of patients. About 69.3% of patients regularly came to the clinic and 87.6% regularly refilled their medication. There was a statically significant relationship between diabetes under control and patient age, frequency of HgA1C monitoring, type of therapy, and the number of drugs taken (P-Value<0.05).

Conclusions: The findings of this study among our diabetic patients led us to conclude that the control of diabetes and adherence to health recommendations are suboptimal.

Therapeutic inertia in the Primary Care nursing professionals, and non-adherence to non-pharmacological treatment in adults with type 2 diabetes mellitus

Noelia Sanz[1], Cristina Gómez[1], Bárbara González[1], Jesús Javier López[1]
[1] RedGDPS

Aim(s) or purpose: Clinical inertia is defined as "the mistakes made at the beginning or the intensification of treatment when this is necessary for the patient, even knowing when they're recommended, they are key for the management of patients with type 2 DM".

Therapeutic inertia (TI) is also understood as the lack of starting or intensification of the treatment for a disease or risk factor when it is indicated".

TI is considered a cause of poorly controlling the goals in persons with type 2 diabetes mellitus (T2DM). It is also a problem that affects health and is difficult to solve since it requires more trained professionals. Because of this situation, we present this research project.

Is there therapeutic inertia among Primary Care nurses and non-adherence to non-pharmacological treatment in adults with type 2 diabetes mellitus treated in primary health centers in Spain?

Design and method: Primary goals:

- To learn and quantify the degree of TI in Primary Care Nursing (PCN).
- To learn and quantify the degree of non-adherence to non-pharmacological treatment in adults with T2DM.

Secondary goals:

- To learn and quantify the degree of TI in nurses, regarding non-pharmacological treatment
- To investigate barriers and potential solutions for TI in nurses, regarding non-pharmacological treatment in people with T2DM.
- Patients and methods: Quantitative-descriptive-transversal-multicenter study.
- Study population: Nurses from different regions in Spain and patients with T2DM
- Inclusion criteria: Nurses caring for adult patients with T2DM
- Exclusion criteria: Nurses who do not provide care for adult patients with T2DM

Variables to study:

- Demographic characteristics of the sample
- To identify forms of behaviour and attitudes
- To discover and verify the possible association of the research variables
- Data collection techniques and tools:
- Questionnaires
- TI in nursing (authors' creation)
- Patients with T2DM and with knowledge about their disease, adherence to non-pharmacological treatment and obstacles to therapeutic compliance (ECODI Diabetes knowledge scale by Bueno y Col and Summary of Diabetes self-care Activities measure)

Records:

- Demographic data
- Clinical records
- Statistical reports: Spreadsheet for data collection

Results: In the process of development.

Type 2 diabetes: new glucose-lowering medication in Primary Care

Isabelle Op de Beeck[1], *Julie Lecomte*[1], *Geert Godderis*[1]
[1] KU Leuven

Aim(s) or purpose: To determine the knowledge and prescribing behaviour regarding new type 2 diabetes medication in general practice and to explore demographic differences. Doctors in Belgium are bound by prescription criteria which do not always correspond to international guidelines.

Design and method: A mixed methods study with an online questionnaire was conducted in Flanders. A random sample of 202 Flemish general practitioners (GPs) and GPs in training was obtained. Knowledge and practices about diabetes care were evaluated using ten theoretical questions and six clinical cases, based on the ADA/EASD guidelines and the Belgian reimbursement criteria.

Results: 201 GPs and GPs in training were included in this study. 44 (21.89%) participants had poor test results, defined as a correct answer rate of less than 70%. The mean test result was 47.6%. Qualitative analysis showed that 90% of the respondents correctly recommended a sglt2 inhibitor when the clinical case showed a comorbidity of heart failure, where only 42% suggested a GLP-1 agonist with cardiovascular disease. Subgroup analysis showed no statistically significant demographic differences in the test results. 23% of the respondents would prescribe medication that did not match the reimbursement criteria in at least one of the 6 proposed clinical cases.

Conclusions: These study results show a lack of knowledge regarding new type 2 diabetes medication and the reimbursement criteria in Belgium. This warrants further investigation.

Study on the therapeutic efficacy between dapagliflozin and teneligliptin as add on therapy to metformin in type 2 diabetes mellitus patients

Malay Parekh[1], *Banshi Saboo*[1], *Shruti Sheth*[1], *Vidhisha Patel*[1], *Akash Prajapati*[1]
[1] Dia Care

Aim(s) or purpose: The number of people with diabetes is quickly rising across the globe. The burden of diabetes and its complications is increasing. Therefore, our aim is to study the therapeutic efficacy between

dapagliflozin (SGLT2 Inhibitor) and teneligliptin (DPP4 Inhibitor) as an add on therapy to metformin in Type 2 Diabetes Mellitus patients.

Design and method: A total of 150 type 2 diabetic mellitus patients receiving metformin attending our clinic during July-December 2019 were included. This was a single blind randomized comparative study. All stable 150 patients using metformin received teneligliptin 20 mg or dapagliflozin 10 mg daily. The primary end point was the change from the baseline in HbA1C at 28 weeks. Secondary end points included the change in (FPG) fasting plasma glucose, % change in BW (body weight), SBP (systolic blood pressure), LDL cholesterol and TG (triglycerides). Adverse event (AE) reports were used for safety assessment.

Results: In our study HbA1c reduction with 20 mg teneligliptin was (0.58%) while with 10 mg dapagliflozin the reduction was (0.88%) at 28 weeks. Compared to teneligliptin, significant reduction in body weight, fasting plasma glucose, systolic blood pressure, LDL and TG were observed with dapagliflozin ($p<0.001$). For both groups, the incidence of serious Adverse event and Adverse event-related discontinuations was low. Hypoglycemia not detected in any groups.

Conclusions: Our study suggests that compared to teneligliptin, dapagliflozin is a very good alternative in view of the reduction in body weight, blood pressure and glycemic control as an add on therapy with metformin in type 2 diabetes mellitus patients. In order to live a healthy life, it is important for patients to control their blood sugar, cholesterol level, & blood pressure.

Overtreatment of type 2 diabetes in the elderly

Escarlata Angullo[1], Joana Maria Font[1], Maria Lara Amengual[1], Susana Martínez[1], Ignacio Ricci[1]

[1] IBSALUT

Aim(s) or purpose: Intensive antidiabetic treatment benefits in type 2 diabetes mellitus (DM) in the elderly are limited and can also increase the hypoglycemia risk, side effects and mortality. The aim is to assess overtreatment (defined as a HbA1c <7% plus antidiabetic treatment) prevalence in ≥ 75 years old type 2 DM patients.

Design and method: Descriptive cross-sectional study. Patients with type 2 DM, ≥75 years old with a HbA1c measurement in the last 12 months were selected from our practice. Descriptive statistical analysis was performed using Chi-squared to estimate differences between groups (STATA v 12.0).

Results: 249 subjects (55.8% men), medium age 82.35 years (35% ≥ 85 years old), type 2 DM mean duration of 10 years and mild dependence (Barthel: 82.08). 27.3% had a high degree of morbidity complexity. Mean HbA1c 6.9%, 62% of them had a HbA1c <7%. Metformin was the most used drug (49%), followed by iDPP-4 (24.5%). 28% of subjects were treated with insulin or sulfonylurea (19.6% and 8.4%, respectively). The use of insulins was significantly higher ($p = 0.015$) in the groups with greater clinical complexity. The use of antidiabetics was appropriate according to renal dysfunction.

39% of the sample underwent overtreatment, 66% of them were treated with a single drug, 24% with 2 drugs and 11% with 3 or more antidiabetics. Overtreatment was significantly higher in subjects receiving one antidiabetic ($p <0.001$). The proportion of overtreated subjects was not significantly higher in the group using drugs at low risk of hypoglycemia (42%) vs those at high risk (31%). 66% of overtreated patients were treated with a single drug, 24% with 2 drugs and 11% with 3 or more antidiabetics. No significant differences were seen depending on morbidity complexity.

Conclusions: Overtreatment of type 2 DM in the elderly is a prevalent problem, especially in patients receiving a single medication or low hypoglycemic risk antidiabetics.

Vibrating insole therapy improves plantar sensation in patients with type 2 diabetes mellitus and advanced peripheral neuropathy in the short and long term

Liezel Ennion[1], Juha Hijmans[2]

[1] University of the Western Cape, [2] University Medical Center Groningen

Aim(s) or purpose: This study aimed to determine if the therapeutic application of vibrating insoles could improve plantar sensation in persons with diabetic sensory peripheral neuropathy (SPN), and if the effect was retained over time.

Design and method: A longitudinal, quasi-experimental cohort study design collected data from 22 participants with Type II Diabetes Mellitus and sensory peripheral neuropathy in Cape Town, South Africa. A vibrating insole was used for 30 minutes daily over one calendar month. Vibration perception threshold (VPT) data was collected with a Bio-thesiometer at baseline, post-intervention and following a one-month and three-month washout period. Descriptive statistics and repeated measures ANOVA with Bonferroni correction was performed using SPSS version 27.

Results: A statistically significant reduction in VPT from 34V at baseline to 27V post-intervention was observed in 86% (n = 19) of the participants, which was retained after a one-month and three-month washout period without additional intervention.

The mean age of participants in the final study sample was 58 years of age (range 39 - 78; SD+- 9 years and 11 months). A total of 14 females and 8 males participated in the study. A main effect of time on VPT was shown ($F(1, 1{,}738) = F\ 248.004$, $p < 0.001$). The reduced VPT effect was present at post-intervention (VPT2) and post-washout (VPT3) in 82% (n = 18) of the participants.

Conclusions: Improved sensation is thought to be clinically protective against diabetic foot ulcers and subsequent lower extremity amputation. The use of a vibrating insole intervention can result in significant improvement in plantar sensation and the retention of a therapeutic effect over time could potentially prevent the occurrence of a first foot ulcer and subsequent amputation.

Which is the best anthropometric measure to approximate to cardiovascular risk?

Marc Olivart[1], Neus Miró[1], Marta Ortega[2], Joaquim Culleré[2], Eva Maria Artigues[2], Karen Rodríguez[3]

[1] Institut Català de la Salut - ABS Tàrrega, [2] Direcció d'Atenció Primària Lleida - Unitat de Suport a la Recerca, [3] Institut Català de la Salut - ABS Mollerussa

Aim(s) or purpose: To determine the relation between anthropometric measures and cardiovascular risk through calculators of cardiovascular risk (Regicor, Framingham, Score and Heart).

Design and method: Descriptive cross-sectional study by simple random sampling of patients who came to a consultation in a Primary Care attention area. 438 patients were included (18-70 years) after having signed the informed consent. Patients with thyroid pathology, pregnancy, severe acute disease or persistent decompensated disease (pneumonia, heart failure...) were excluded. Variables of interest: gender, age, weight, height, neck and waist circumference, and lipid profile (blood test of the last 12 months). Indexes calculated with the data: body mass index (BMI), waist and neck circumference, chronicity index, cardiovascular risk.

Results: All indexes have a significant association with cardiovascular risk except BMI and neck circumference with Score. The index that presents the highest association with all calculators of cardiovascular risk is the chronicity index. Using only the chronicity index and gender can explain up to 31% of the variability in the cardiovascular risk by Framingham and Heart. The index that presents the least association with all calculators of cardiovascular risk is BMI. The highest variability is about 16% according to Framingham and Heart.

There is a significant difference with the model using BMI and the other models ($p<0.05$) in all comparisons. Neck circumference is slightly more associated with the calculators of cardiovascular risk than BMI, but far from the chronicity index and always less than the waist-height ratio and waist circumference.

To assess the capacity of classification into groups of risk (low, medium, high) of the different indexes, ROC curves in 3D have been calculated and the optimum cut off point for each index has been established, with significant results only for the chronicity index in the prediction of risk according to Framingham.

Conclusions: The best anthropometric measure to approximate vascular risk is the chronicity index.

INDUSTRY-SPONSORED SATELLITE SYMPOSIA

BREAKFAST SATELLITE SYMPOSIUM

The role of PCPs in the early diagnosis and treatment of CKD in T2DM

Date: Friday, 16 June 2023 ◢ **Time:** 08:00 - 09:00 ◢ **Room:** Meeting Room (5+6)

Agenda

Welcome & Introduction

CK2 in T2DM – Treatment and approaches and unmet needs. ***Ana Cebrián***

Finerenone in current CKD treatment in the T2DM therapeutic landscape. ***Samy Hadjaj***

Practical considerations for the management of patients with CKD and T2DM. ***Boris Klanger***

Discussion panel: The significance of PCPs in early diagnosis for the treatment pathway

Sponsored by BAYER

LUNCH SATELLITE SYMPOSIUM

Beyond current treatment standards in diabetes care - The central role of weight loss

Date: Friday, 16 June 2023 ◢ **Time:** 13:00 - 14:30 ◢ **Room:** Meeting Room (5+6)

Agenda

Introduction & Welcome

T2DM management in Primary Care – The gap between guidelines and clinical practice. ***Stefan Jansson***

The central role of weigh loss in diabetes care – Incretins on the increase. ***Melanie Davies***

Delivering contemporary diabetes care – A practical approach. ***Samuel Seidu***

Beyond current treatment Standards – A mandate for Primary Care. ***Melanie Davis***

Questions & Answers

Organised by Medscape Education Global

AFTERNOON SATELLITE SYMPOSIUM

Multi-organ impact: Harnessing the benefits of SGLT2 inhibitors

Date: Friday, 16 June 2023 ◢ **Time:** 17:30 - 18:30 ◢ **Room:** Meeting Room (5+6)

Chair: Pinar Topsever

Agenda

Welcome & Introduction. ***Pinar Topsever***

Where is your CKD patient? ***Pinar Topsever***

SGLT2 inhibitors: Multi-organ protection for Primary Care patients. ***Waqas Tahir***

Practical considerations for CKD management: Time to think differently. ***Ana Cebrián***

Panel discussion and Q&A

Summary & Closing statements. ***Pinar Topsever***

Supported by an Unrestricted Educational Grant from AstraZeneca

BREAKFAST SATELLITE SYMPOSIUM

Treatment of chronic kidney disease: new directions for daily clinical practice

Date: Saturday, 17 June 2023 ◢ **Time:** 08:00 - 09:00 ◢ **Room:** Meeting Room (5+6)

Chairs: *Naresh Kanumilli & Pinar Topsever*

Agenda

Welcome & Introduction. ***Naresh Kanumilli***

Increasing the utilization of diagnostic strategies in CKD. ***Javier Ampudia-Blasco***

Shaping the treatment of CKD with new approaches. ***Per-Henrik Groop***

Strengthening successful CKD management in Primary Care. ***Naresh Kanumilli***

Discussion & Closure. ***Pinar Topsever***

Organized by Sciarc, kindly supported by a Medical Education Grant from Boehringer Ingelheim and Eli Lilly Alliance

Leicester Diabetes Centre

This symposium is endorsed by Leicester Diabetes Centre and accredited for 1 CPD credit by the Royal College of Physicians

Multi-organ impact: Harnessing the benefits of SGLT2 inhibitors

Friday, 16th June 2023; 17:30–19:00 CEST

Pınar Topsever (Chair)
Acıbadem University
School of Medicine
Turkey

Ana Cebrián
San Antonio Catholic
University of Murcia
Spain

Waqas Tahir
Affinity Care
Westcliffe Medical Practice
UK

Agenda

Time (CEST)	Session	Speaker
17:30–17:45	Welcome and introduction	Pınar Topsever
17:45–18:00	Where is your CKD patient?	Pınar Topsever
18:00–18:20	SGLT2 inhibitors: Multi-organ protection for the primary care patient	Waqas Tahir
18:20–18:35	Practical considerations for CKD management: Time to think differently	Ana Cebrián
18:35–18:55	Panel discussion and Q&A	All faculty
18:55–19:00	Summary and close	Pınar Topsever

SCIENCE COLLECTED

AstraZeneca

Supported by an unrestricted educational grant from AstraZeneca.

INDUSTRY PARTNERS

CONFERENCE SPONSORS

(Listed in alphabetical order)

Astrazeneca

Bayer

Boehringer Ingelheim

Lilly

Sponsor of unconditional educational grants for five delegates

Lifescan

PCDE GOLD CORPORATE MEMBERS (2023)

Novo Nordisk

PCDE BRONZE CORPORATE MEMBER (2023)

Astrazeneca

Lilly

PCDE

primary care diabetes europe

CONGRESOS
Y EDICIONES
SEMFYC

Conference Secretariat

Congresos y Ediciones semFYC
Carrer del Pi, 11, 2.ª planta, oficina 13
08002 Barcelona
Tel. (+34) 93 317 71 29
congresos@semfyc.es