

Diabetes

Current Awareness Bulletin

June 2024

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Articles

Association of iron status with all-cause and cause-specific mortality in individuals with diabetes

Shen C, Yuan M, Zhao S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111058.

[**Aims:** Current evidence regarding iron status and mortality risk among patients with diabetes is limited. This study aimed to evaluate association of iron indices with all-cause and cause-specific mortality risk among patients with diabetes.]

Bringing an end to diabetes stigma and discrimination: an international consensus statement on evidence and recommendations

Speight J, Holmes-Truscott E, Garza M, et al. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.61-82.

[People with diabetes often encounter stigma (ie, negative social judgments, stereotypes, prejudice), which can adversely affect emotional, mental, and physical health; self-care, access to optimal health care; and social and professional opportunities. To accelerate an end to diabetes stigma and discrimination, an international multidisciplinary expert panel (n=51 members, from 18 countries) conducted rapid reviews and participated in a three-round Delphi survey process. We achieved consensus on 25 statements of evidence and 24 statements of recommendations. The consensus is that diabetes stigma is driven primarily by blame, perceptions of burden or sickness, invisibility, and fear or disgust. On average, four in five adults with diabetes experience diabetes stigma and one in five experience discrimination (ie, unfair and prejudicial treatment) due to diabetes, such as in health care, education, and employment. Diabetes stigma and discrimination are harmful, unacceptable, unethical, and counterproductive. Collective leadership is needed to proactively challenge, and bring an end to, diabetes stigma and discrimination. Consequently, we achieved unanimous consensus on a pledge to end diabetes stigma and discrimination.]

Call to action on diabetes care: reaching communities facing health inequalities, health inequities and deprivation.

Phillips A. *British Journal of Nursing* 2024;33(1):16-20.

[This article presents evidence and policy on the importance of reaching out into local communities with inclusive approaches to try to reduce and prevent inequities and inequalities in diabetes care. The global emergency diabetes is causing and the risks and disproportionately high ethnic disparities are investigated. The article includes some suggestions on changing approaches to reduce health inequalities to enable diabetes care to become more accessible for those who need it the most.]

Correction to Lancet Diabetes Endocrinol 2023; 11: 798–810

Lancet Diabetes & Endocrinology, 2024, 12(1), e.1.

[Sandforth A, von Schwartzberg RJ, Arreola EV, al. *Mechanisms of weight loss-induced remission in people with prediabetes: a post-hoc analysis of the randomised, controlled, multicentre Prediabetes Lifestyle Intervention Study (PLIS)*. *Lancet Diabetes Endocrinol* 2023; 11: 798–810.]

Correction to Lancet Diabetes Endocrinol 2023; 11: 942–54

Lancet Diabetes & Endocrinology, 2024, 12(1), e.1.

[Nazari MA, Hasan R, Haigney M, et al. *Catecholamine-induced hypertensive crises: current insights and management*. *Lancet Diabetes Endocrinol* 2023; 11: 942–54.]

Correction to: New-Onset Diabetes Mellitus in COVID-19: A Scoping Review

Stoian A.P., Bica I.C., Salmen T, et al. *Diabetes Therapy* 2024, 15(1): 297-299.

[This corrects "New-Onset Diabetes Mellitus in COVID-19: A Scoping Review." *Diabetes Ther.* 2024 Jan;15(1):33-60.]

From research to policy: still a long way to go

The Lancet Diabetes & Endocrinology. *Lancet Diabetes & Endocrinology*, 2024, 12(1), p.1.

[As 2023 draws to a close, it is time to reflect upon and celebrate the year's most impactful research findings in diabetes and endocrinology. However, this last Editorial of the year will not highlight those findings—as rewarding as that might have been for both editors and readers. Instead, this text will mention two realities that deserve more attention than they get: the extent of research waste and the extent of research, that despite its transformative potential for impact, goes unnoticed or is dismissed by policy makers.]

Highlights of the current issue

Wang N Associate Editor, Misra A Editor-in-Chief. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102948.

[**From the Editor's Desk:** In our latest issue, we've described key highlights from all published articles, providing readers with a concise overview. Access the summarized content and direct article links through the provided weblinks for a quick and comprehensive understanding of the valuable insights shared in this issue. We trust you'll find this feature, started for the first time for our journal, beneficial.]

Improving the outcomes for people with diabetes undergoing surgery: An observational study of the Improving the Peri-operative Pathway of People with Diabetes (IP3D) intervention

Rayman G, Page E, Hodgson S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111062.

[**Aims:** We evaluated the effectiveness of an intervention to improve the care of people with diabetes undergoing surgery when implemented across multiple organisations.]

New-Onset Diabetes Mellitus in COVID-19: A Scoping Review

Stoian A.P., Bica I.C., Salmen T, et al. *Diabetes Therapy* 2024, 15(1): 33-60.

[**Introduction:** The coronavirus disease 2019 (COVID-19) pandemic became superimposed on the pre-existing obesity and diabetes mellitus (DM) pandemics. Since COVID-19 infection alters the metabolic equilibrium, it may induce pathophysiologic mechanisms that potentiate new-onset DM, and we evaluated this issue.]

Unfavorable social determinants of health and risk of mortality in adults with diabetes: findings from the National Health Interview Survey

Chang R, Philip J, Javed U, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003710

[**Introduction:** Understanding the role of social determinants of health as predictors of mortality in adults with diabetes may help improve health outcomes in this high-risk population. Using population-based, nationally representative data, this study investigated the cumulative effect of unfavorable social determinants on all-cause mortality in adults with diabetes.]

Guidelines

PCV risk groups: patient group direction template.

UK Health Security Agency (UKHSA); 2024.

<https://www.gov.uk/government/publications/pcv-risk-groups-patient-group-direction-template>

[Patient group direction (PGD) template to support the provision of PCV13 vaccine to individuals with underlying medical conditions.]

Articles

Incidence, prevalence, and mortality of type 1 diabetes in children and youth in Burkina Faso 2013-2022

Sagna Y, Bagbila W.P.A.H., Sawadogo N, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111086.

[**Aim:** There are no data on type 1 diabetes (T1D) incidence and prevalence in Burkina Faso. We aimed to determine these in persons aged <25 years (y) since the implementation of Life for a Child (LFAC) program in 2013.]

Pediatric diabetes mellitus hospitalizations and COVID-19 pandemic response measures

Shimony H, Miller L, Reich P, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111060.

[**Aims:** In the United States, evidence suggests that during the COVID-19 pandemic, admissions of patients with diabetes mellitus (DM) have increased. This study assessed hospital admission rates for pediatric type 1 (T1DM) and type 2 (T2DM) diabetes mellitus during 2019–2021, and the potential influence of the timing of various pandemic response measures.]

Co-morbidities (find here cardiovascular, kidney disease, neuropathy, diabetic retinopathy etc)

Cardiovascular Disease

Articles

Comparison of GLP-1 receptor agonists and other Glucose-Lowering agents on cardiovascular outcomes in individuals with type 2 diabetes and Obesity: A Spanish Real-World Population-Based study

Palanca A, Ampudia-Blasco F.J., Calderón J.M., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111071.

[**Aims:** Assess the impact of glucagon-like peptide receptor agonists (GLP-1RA) compared to other glucose-lowering agents on cardiovascular outcomes in individuals with type 2 diabetes and obesity in a Spanish metropolitan area.]

Coronary artery disease patients with rs7904519 (TCF7L2) are at a persistent risk of type 2 diabetes

Al Hageh C, O'Sullivan S, Platt D.E., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111052.

[**Aims:** Type 2 diabetes (T2D) and coronary artery disease (CAD) often coexist and share genetic factors. This study aimed to investigate the common genetic factors underlying T2D and CAD in patients with CAD.]

Correction: Normative data on cardiovascular autonomic function in Greenlandic Inuit

Christensen M.M.B., Hansen C.S., Fleischer J, et al. *BMJ Open Diabetes Research and Care* 2024;12:e002121corr1

[This article was previously published with an error. The original paper presented normative thresholds of cardiovascular autonomic function in Greenlanders without diabetes. The levels of the normative thresholds were relatively low, and authors discussed in the paper, that they could only speculate on the reason for the seemingly reduced level of cardiovascular autonomic function in healthy Greenlanders. The thresholds were derived from analyses based on a Greenlandic study population for

which they lacked extensive descriptive details. Meanwhile, authors have received information indicating that some of the participants previously have been identified with diabetes in a different study. Likewise, authors obtained information on medication taken by some of the participants when they were examined. This new information has led to substantial amendments in the study population, requiring the exclusion of 99 individuals. These adjustments have impacted the normative thresholds, causing them to rise despite remaining relatively modest. It is highly relevant to adjust the normative thresholds as they may be applied to diagnose cardiovascular autonomic dysfunction in Greenlanders.]

Dapagliflozin-Induced Myocardial Flow Reserve Improvement is not Associated with HDL Ability to Stimulate Endothelial Nitric Oxide Production

Capece U, Pavanello C, Cinti F, et al. *Diabetes Therapy* 2024, 15(1): 257-268.

[Background: Sodium-glucose cotransporter-2 (SGLT2) inhibitors have shown controversial results in modulating plasma lipids in clinical trials. Most studies found slight increases in high-density lipoprotein (HDL) cholesterol but few have provided evidence on HDL functionality with disappointing results. However, there is broad agreement that these drugs provide cardiovascular protection through several mechanisms. Our group demonstrated that dapagliflozin improves myocardial flow reserve (MFR) in patients with type 2 diabetes (T2D) with coronary artery disease (CAD). The underlying mechanisms are still unknown, although in vitro studies have suggested the involvement of nitric oxide (NO).

Aim: To investigate changes in HDL-mediated modulation of NO production with dapagliflozin and whether there is an association with MFR.]

Diabetes and risk of heart failure in people with and without cardiovascular disease: systematic review and meta-analysis

Panchal K, Lawson C, Chandramouli C, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111054.

[Background: People with diabetes have an increased risk of heart failure (HF), compared to those without diabetes. However, no comprehensive systematic review and meta-analysis has explored whether these associations could differ in relation to prevalent cardiovascular disease (CVD).

Aims: To estimate the association between diabetes and incident heart failure (HF), compared to without diabetes, in individuals with and without CVD.]

Efficacy and safety of bempedoic acid among patients with and without diabetes: prespecified analysis of the CLEAR Outcomes randomised trial

Ray K.K., Nicholls S.J., Li N, et al. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.19-28.

[Background: Statins reduce LDL cholesterol and cardiovascular events among those with or without diabetes but have been reported to increase new-onset diabetes. The CLEAR Outcomes trial demonstrated that bempedoic acid reduced the risk of major adverse cardiovascular events among statin-intolerant patients at high cardiovascular risk. In this prespecified analysis, our dual aims were to evaluate the cardiovascular benefits of bempedoic acid, an ATP-citrate lyase inhibitor, in individuals with diabetes, and to evaluate the risk of new-onset diabetes and HbA 1c among those without diabetes in the CLEAR Outcomes trial.]

Frailty and risk of microvascular disease in adults with prediabetes

Zhong P, Liu R, Zhu Z, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102942.

[Background and aims: To assess the relationship between frailty phenotypes and the risk of MVD among prediabetics in two prospective cohorts.]

The hidden treasure of gestational diabetes-mediated myocardial function

Costa J.A., Mambié M, Verd S. *Diabetes Research and Clinical Practice* 2024, 207: 111049.

[An increasing number of studies [1] have addressed impaired subclinical ventricular function or pulmonary vascular resistance beyond the early newborn period in infants of mothers with gestational diabetes (GDM). We would like to highlight how this kind of pioneering research overlaps research focusing on the role of human milk feeding (HM) on cardiac maturation in the short to medium term.]

Impact of sodium-glucose cotransporter 2 inhibitors on cardiovascular outcomes in patients with chronic kidney disease: propensity score matched analysis

Sun W, Yan B.P. *BMJ Open Diabetes Research and Care* 2024;12:e003544

[Type 2 diabetes mellitus (T2DM) is the most common cause of chronic kidney disease (CKD). ¹ Age-adjusted prevalence of CKD in patients with T2DM is approximately 40%, of which majority are mild to moderate. ² The risk gradient of cardiovascular (CV) mortality in CKD increased linearly with decreased glomerular filtration rate (GFR) but changed little when GFR was greater than 75. ³]

Risk factors for peripheral artery disease and diabetic peripheral neuropathy among patients with type 2 diabetes

Chen T, Xiao S, Chen Z, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111079.

[**Aims:** To investigate the prevalence of peripheral artery disease (PAD) and diabetic peripheral neuropathy (DPN) and the associated risk factors among Chinese patients with type 2 diabetes mellitus.]

Soluble urokinase plasminogen activator receptor, platelet aggregation, and carotid plaque thickness in diabetes: A cross-sectional analysis

Curovic V.R., Tavenier J, Ferreira-Divino L.F., et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108654.

[**Background:** Soluble urokinase plasminogen activator receptor (suPAR) is an inflammatory biomarker strongly linked with cardiovascular disease in diabetes. By investigating its association with platelet aggregation levels and carotid plaque thickness, we can potentially improve the characterization of cardiovascular pathophysiology in type 1 (T1D) and type 2 diabetes (T2D).]

U-shaped association between stress hyperglycemia ratio and risk of all-cause mortality in cardiac ICU

Li L, Ding L, Zheng L, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102932.

[**Background:** Stress hyperglycemia has been associated with poor prognosis in patients admitted to the cardiac intensive care unit (ICU). Recently, the stress hyperglycemia ratio (SHR) has been proposed to reflect true acute hyperglycemic. This study aimed to investigate the relationship between SHR and prognosis of patients in the cardiac ICU.]

What's New in Obesity from UpToDate.

Semaglutide and cardiovascular outcomes (January 2024)

Semaglutide and other glucagon-like peptide 1 receptor agonists can reduce rates of adverse cardiovascular events in individuals with type 2 diabetes who have established cardiovascular disease or are at high risk of cardiovascular disease. In a newly published trial of 17,604 individuals with overweight or obesity and cardiovascular disease but not diabetes, once-weekly subcutaneous semaglutide 2.4 mg reduced rates of adverse cardiovascular outcomes compared with placebo (6.5 versus 8.0 percent) [16]. Discontinuation of the study drug due to side effects occurred more often with semaglutide (17 versus 8 percent). For individuals with overweight or obesity and established cardiovascular disease, semaglutide is a particularly attractive option for chronic weight management.

Diabetic Ketoacidosis

Articles

Diabetic ketosis vs ketoacidosis as initial presentation of pediatric type 1 diabetes mellitus. Associated features and rate of progression during the first two years after diagnosis

Giannakopoulos A, Chrysanthakopoulou N, Efthymiadou A, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108667.

[**Aims:** In this study we described the clinical and laboratory features of children presented with diabetic ketosis or diabetic ketoacidosis at diagnosis of type 1 diabetes (T1DM) and evaluated its course up to 2 years after initial diagnosis to investigate the progression rate of T1DM in both groups.]

Effectiveness of interventions for emergency care of hypoglycaemia and diabetic ketoacidosis: A systematic review

Maharjan J, Pandit S, Johansson K.A., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111078.

[**Aim:** This systematic review aims to provide evidence on effectiveness of interventions used in emergency care of hypoglycaemia and diabetic ketoacidosis (DKA).]

Diabetic Neuropathy

Articles

Alpha-lipoic acid for diabetic peripheral neuropathy.

Baicus C, Purcarea A, Von Elm E, et al. *Cochrane Database of Systematic Reviews* 2024;1:CD012967.

[**Background:** Diabetic peripheral neuropathy (DPN) is a frequent complication in people living with type 1 or type 2 diabetes. There is currently no effective treatment for DPN. Although alpha-lipoic acid (ALA, also known as thioctic acid) is widely used, there is no consensus about its benefits and harms.

Objectives: To assess the effects of alpha-lipoic acid as a disease-modifying agent in people with diabetic peripheral neuropathy.]

Midnight Cortisol is Associated with Changes in Systolic Blood Pressure and Diabetic Neuropathy in Subjects with Type 1 Diabetes Undergoing Simultaneous Kidney-Pancreas Transplantation

Boswell L, Amor A.J., Montagud-Marrahi E, et al. *Diabetes Therapy* 2024, 15(1): 165-181.

[**Introduction:** An increased midnight cortisol (MC) has been described in end-stage kidney disease (ESKD) and type 1 diabetes (T1D). Lower circulating levels of the cytokine soluble tumor necrosis factor (TNF)-like weak inducer of apoptosis (sTWEAK) have been found in T1D and ESKD and associated with cardiovascular (CV) events in the latter. We aimed to study MC and sTWEAK in simultaneous pancreas-kidney transplant (SPKT) recipients, and the association of these markers with CV risk factors and transplant outcomes.]

Quantitative sensory testing defines the trajectory of sensory neuropathy after severe COVID-19

Ponirakis G, Odriozola A, Ortega L, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111029.

[**Aims:** To assess sensory neuropathy development after severe COVID-19.]

Risk factors for peripheral artery disease and diabetic peripheral neuropathy among patients with type 2 diabetes

Chen T, Xiao S, Chen Z, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111079.

[**Aims:** To investigate the prevalence of peripheral artery disease (PAD) and diabetic peripheral neuropathy (DPN) and the associated risk factors among Chinese patients with type 2 diabetes mellitus.]

Eye Diseases

Articles

Diabetic retinopathy related homeostatic dysregulation and its association with mortality among diabetes patients: A cohort study from NHANES

Li W, Lai Z, Tang N, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111081.

[**Aims:** To develop a metric termed the diabetic retinopathy-related homeostatic dysregulation (DRHD) value, and estimate its association with future risk of mortality in individuals with type 2 diabetes.]

High prevalence of retinopathy in young-onset type 2 diabetes and possible sex differences: insights from Norwegian general practice

Tibballs K, Jennum A.K., Kirkebøen L, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003624

[**Introduction:** People with young-onset type 2 diabetes (YOD), defined as diabetes diagnosis before age 40, have a high lifetime risk of vascular complications. We aimed to estimate the prevalence of YOD among adults with type 2 diabetes (T2D) in Norwegian general practice and explore associations between age at diabetes diagnosis and retinopathy overall and in men and women.]

Ocular microvascular complications in diabetic retinopathy: insights from machine learning

Ahmed T.S., Shah J, Zhen Y.N.B, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003758

[**Introduction:** Diabetic retinopathy (DR) is a leading cause of preventable blindness among working-age adults, primarily driven by ocular microvascular complications from chronic hyperglycemia. Comprehending the complex relationship between microvascular changes in the eye and disease progression poses challenges, traditional methods assuming linear or logistical relationships may not adequately capture the intricate interactions between these changes and disease advances. Hence, the aim of this study was to evaluate the microvascular involvement of diabetes mellitus (DM) and non-proliferative DR with the implementation of non-parametric machine learning methods.]

Young-onset type 2 diabetes and retinopathy: evidence of an adverse phenotype

Song S.H. *BMJ Open Diabetes Research and Care* 2024;12:e003899

[The landscape of type 2 diabetes (T2D) has changed with an increasing number of people being diagnosed under age 40 years. The principal concern with young-onset T2D is the early development of complications, with associated morbidity and premature mortality. In view of the potential impact on the working-age population and the associated personal, societal and economic ramifications, it is important to understand the factors that drive the pathogenesis of these complications in order to mitigate or prevent their occurrence. Few studies have investigated the impact of young-onset T2D on microvascular disease such as retinopathy. As one of the leading causes of blindness and visual impairment in adults under age 40 years,¹ this is a feared complication among people with diabetes and merits further investigation.]

Kidney Disease

Articles

Associations between dietary patterns and renal impairment in individuals with diabetes: a cross-sectional study.

Ding Z, Wu X, Liu C, et al. *Journal of Human Nutrition and Dietetics* 2024;37(1):193-202.

[**Background:** A variety of chronic diseases are affected by diet. To our knowledge, few studies have

investigated the relationship between dietary patterns and renal impairment in individuals with diabetes within an Asian population. This study aimed to assess the relationship between renal impairment and dietary patterns in individuals with diabetes within a Chinese population.]

Clusters of Body Fat and Nutritional Parameters are Strongly Associated with Diabetic Kidney Disease in Adults with Type 2 Diabetes

He A, Shi C, Wu X, et al. *Diabetes Therapy* 2024, 15(1): 201-214.

[**Introduction:** Diabetic kidney disease (DKD) has become the leading cause of chronic kidney disease and end-stage renal failure in most developed and many developing countries. Strategies aimed at identifying potential modifiable risk factors for DKD are urgently needed. Here, we investigated the association between clusters of body fat and nutritional parameters with DKD in adults with type 2 diabetes mellitus (T2DM).]

Diabetes and chronic kidney disease in Chinese adults: a population-based cohort study

Wang X, Chen L, Shi K, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003721

[**Introduction:** Cohort evidence of the association of diabetes mellitus (DM) with chronic kidney disease (CKD) is limited. Previous studies often describe patients with kidney disease and diabetes as diabetic kidney disease (DKD) or CKD, ignoring other subtypes. The present study aimed to assess the prospective association of diabetes status (no diabetes, pre-diabetes, screened diabetes, previously diagnosed controlled/uncontrolled diabetes with/without antidiabetic treatment) and random plasma glucose (RPG) with CKD risk (including CKD subtypes) among Chinese adults.]

Effects of empagliflozin on progression of chronic kidney disease: a prespecified secondary analysis from the empa-kidney trial

The EMPA-KIDNEY Collaborative Group. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.39-50.

[**Background:** Sodium–glucose co-transporter-2 (SGLT2) inhibitors reduce progression of chronic kidney disease and the risk of cardiovascular morbidity and mortality in a wide range of patients. However, their effects on kidney disease progression in some patients with chronic kidney disease are unclear because few clinical kidney outcomes occurred among such patients in the completed trials. In particular, some guidelines stratify their level of recommendation about who should be treated with SGLT2 inhibitors based on diabetes status and albuminuria. We aimed to assess the effects of empagliflozin on progression of chronic kidney disease both overall and among specific types of participants in the EMPA-KIDNEY trial.]

Effects of sodium-glucose cotransporter-2 (SGLT-2) inhibitors on serum uric acid levels in patients with chronic kidney disease: a systematic review and network meta-analysis

Zhang L, Zhang F, Bai Y, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003836

[Elevated serum uric acid levels are an independent predictor of occurrence and development of chronic kidney disease (CKD) and are strongly associated with prognosis. Several clinical trials have demonstrated the benefits of sodium-glucose cotransporter-2 (SGLT-2) inhibitors. To evaluate and rank the effects and safety of various SGLT-2 for serum uric acid levels in patients with CKD. We performed a systematic PubMed, Embase, Scopus, and Web of Science search, including studies published before July 1, 2023. Two researchers independently extracted data on study characteristics and outcomes and assessed study quality using the Cochrane Collaboration's risk of bias tool 2. The gemtc package of R software was used to perform network meta-analysis within a Bayesian framework. The primary outcome was serum uric acid levels, and the secondary outcome was adverse events. Effect sizes are reported as standardized mean differences (SMDs), risk ratio (RR), and 95% CI, respectively. The certainty of evidence was evaluated using Grading of Recommendations, Assessment, Development and Evaluations (GRADE) criteria. Eight RCTs (9367 participants) were included in this meta-analysis. The results of the paired meta-analysis showed that SGLT-2 inhibitors significantly reduced serum uric acid levels in patients with CKD compared with the placebo group (SMD -0.22; 95% CI -0.42 to -0.03; GRADE: low). Pooled analysis of any adverse events reported in the included

studies showed similar incidence rates in the SGLT-2 inhibitor and placebo groups (RR: 0.99; 95% CI 0.97 to 1.00; p=0.147; GRADE: high). Subgroup analysis showed a statistically significant difference only for tofogliflozin. Further network meta-analysis showed that dapagliflozin 10 mg and ipragliflozin 50 mg may be the most effective in reducing uric acid levels. SGLT-2 inhibitors significantly reduced serum uric acid levels in patients with CKD, and dapagliflozin 10 mg and ipragliflozin 50 mg may be the optimal dosages. SGLT-2 inhibitors hold great promise as an antidiabetic therapeutic option for patients with CKD who have elevated serum uric acid levels. PROSPERO registration number: CRD42023456581.]

Empagliflozin in chronic kidney disease: nephroprotection is independent of albuminuria, primary kidney disease, and baseline eGFR

Zoccali C, Mallamaci F. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.5-8.

[Chronic kidney disease, a disease attributable to diabetes in 30–40% of patients, is a major health burden worldwide because it underlies an excess risk for kidney failure cardiovascular disease events. ¹ Large, randomised placebo-controlled trials have shown that renin–angiotensin system (RAS) inhibitors, sodium–glucose co-transporter-2 (SGLT2) inhibitors, and the non-steroidal mineralocorticoid receptor antagonist finerenone reduce the risk of progression to kidney failure in patients with diabetes who have albuminuria. Because, on a world scale, the majority of people with chronic kidney disease have low levels of albuminuria (<300 mg/g creatinine) and do not have diabetes, ² accruing information on the nephroprotective effectiveness of the most recently introduced class of these drugs, SGLT2 inhibitors, in these patient categories is fundamental. In this regard, prespecified subgroup analysis of the DAPA-CKD trial in patients with and without diabetes who had chronic kidney disease and significant albuminuria (>200 mg/g creatinine) ³ has shown that the prevention of kidney failure by dapagliflozin extends to patients without diabetes. Data regarding patients with an estimated glomerular filtration rate (eGFR) of less than 30 mL/min per 1.73 m² are limited, and how nephroprotection by this drug might vary among patients with low albuminuria and across the various causes of chronic kidney disease (including diabetic kidney disease, hypertensive or renovascular disease, and glomerular diseases) are scant.]

Impact of primary kidney disease on the effects of empagliflozin in patients with chronic kidney disease: secondary analyses of the EMPA-KIDNEY trial

The EMPA-KIDNEY Collaborative Group. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.51-60.

[**Background:** The EMPA-KIDNEY trial showed that empagliflozin reduced the risk of the primary composite outcome of kidney disease progression or cardiovascular death in patients with chronic kidney disease mainly through slowing progression. We aimed to assess how effects of empagliflozin might differ by primary kidney disease across its broad population.]

Impact of sodium-glucose cotransporter 2 inhibitors on cardiovascular outcomes in patients with chronic kidney disease: propensity score matched analysis

Sun W, Yan B.P. *BMJ Open Diabetes Research and Care* 2024;12:e003544

[Type 2 diabetes mellitus (T2DM) is the most common cause of chronic kidney disease (CKD). ¹ Age-adjusted prevalence of CKD in patients with T2DM is approximately 40%, of which majority are mild to moderate. ² The risk gradient of cardiovascular (CV) mortality in CKD increased linearly with decreased glomerular filtration rate (GFR) but changed little when GFR was greater than 75. ³]

Optimizing Collaborative Care of Patients with Chronic Kidney Disease Associated with Type 2 Diabetes: An Example Practice Model at a Health Care Practice in Kentucky, United States

Gatlin B, Miller J, Chang S. *Diabetes Therapy* 2024, 15(1): 1-11.

[Suboptimal multidisciplinary team collaboration is a barrier to effective health care provision for patients with chronic kidney disease (CKD) associated with type 2 diabetes mellitus (T2DM). We describe an example practice model of a clinical practice called Baptist Health Deaconess, based in Madisonville, Kentucky, USA, where a small multidisciplinary team consisting of an endocrinologist,

nurse practitioner, and pharmacist (authors of this article) work collaboratively in an ambulatory care setting to provide health care to the patients they serve. Many of the patients who receive care at Baptist Health Deaconess are on a low income, have poor health literacy, and do not have a primary care physician. The presence of a pharmacist in the team allows for insurance/access investigations to assess drug choice and affordability; such aspects can be performed quickly with a pharmacist in the office.]

Liver Diseases

Articles

Association of human leukocyte antigen (HLA) footprints with the comorbidity of latent autoimmune diabetes in adults (LADA) and hepatitis C virus (HCV) infection: A multicenter cross-sectional study

Ding Y, Zhang P, Deng T, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102939.

[**Aims:** This study aims to investigate the interplay between hepatitis C virus (HCV) infection and major forms of diabetes: type 1 diabetes (T1D), type 2 diabetes (T2D), and latent autoimmune diabetes in adults (LADA).]

Combined impact of Hepatitis B virus and gestational diabetes mellitus on ultrasound-measured fetal growth and adverse perinatal outcomes: A seven-year retrospective study

Tu Y, Li Y, Fan X, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111092.

[**Aims:** To investigate the impact of pregnancy with combined hepatitis B virus (HBV) infection and Gestational diabetes mellitus (GDM) on fetal growth and adverse perinatal outcomes.]

DM incidence in lean NAFLD

Wu Y, Li L, Jiang Y. *Diabetes Research and Clinical Practice* 2024, 207: 111089.

[We would like to acknowledge the contribution of the meta-analysis by Gao et al. [1] to explore the association between lean non-alcoholic fatty liver disease (NAFLD) and the incidence of type 2 diabetes mellitus (T2DM). Currently, the diagnosis and assessment of lean NAFLD, as opposed to obesity counterparts, are frequently overlooked, raising concerns about its long-term prognosis. A recent meta-analysis revealed a higher liver-specific mortality in lean individuals with NAFLD compared to those who are obese [2]. Additionally, up to two-thirds (65.04 %) within T2DM patients has been observed to be afflicted with NAFLD [3]. Consequently, this article systematically outlines the associations between lean NAFLD and T2DM onset, shedding light on the interplay between lean NAFLD and metabolic syndrome. Nevertheless, the following points require in-depth exploration.]

Inhibition of IL-33 signaling ameliorate hepatic fibrosis with decreasing MCP-1 in a mouse model of diabetes and non-alcoholic steatohepatitis; comparison for luseogliflozin, an SGLT2 inhibitor

Wakamatsu S, Jojima T, Hashiguchi M, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108650.

[Non-alcoholic fatty liver disease (NAFLD) is increasing globally, and seeking therapeutic molecule targets is urgent. Several studies have demonstrated that IL-33 plays an important role in the progression of Non-alcoholic steatohepatitis (NASH) with fibrosis and the proliferation of hepatocellular carcinoma (HCC). However, whether the inhibition of IL-33 signaling prevents NAFLD from progressing to NASH and HCC has not been clarified. We investigated the effects of a novel antibody, IL-33Rab, and luseogliflozin, a SGLT2 inhibitor, when administered to a model mouse for NASH and HCC, and their effects were compared to investigate the mechanisms of how IL-33 is involved in the pathogenesis of NASH progression. Compared with the positive control of luseogliflozin, inhibition of IL-33 signaling ameliorated decreasing hepatic fibrosis via decreasing α SMA and MCP-1, and also

partially suppressed the progression of the HCC cell line in in vitro experiments. These findings suggest that inhibition of IL-33 possibly prevents progression from NASH to HCC, and their effect may be a newly arrived therapeutic agent.]

Management of type 2 diabetes in patients with compensated liver cirrhosis: Short of evidence, plenty of potential

Arvanitakis K, Koufakis T, Kalopitas G, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102935.

[**Background and aims:** Treatment of type 2 diabetes (T2D) in patients with compensated cirrhosis is challenging due to hypoglycemic risk, altered pharmacokinetics, and the lack of robust evidence on the risk/benefit ratio of various drugs. Suboptimal glycaemic control accelerates the progression of cirrhosis, while the frequent coexistence of nonalcoholic fatty liver disease (NAFLD) with T2D highlights the need for a multifactorial therapeutic approach.]

Complications (find here atherosclerosis, claudication, diabetic foot, ulcers etc)

Diabetic Foot

Articles

Continuous intrafemoral artery infusion of urokinase improves diabetic foot ulcers healing and decreases cardiovascular events in a long-term follow-up study

Tong J, Zhang J, Xiang L, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003414

[**Introduction:** Diabetic foot ulcer (DFU) is a disabling complication of diabetes mellitus. Here, we attempted to assess whether long-term intrafemoral artery infusion of low-dose urokinase therapy improved DFUs and decreased cardiovascular events in patients with DFUs.]

Effects of individually optimized rocker midsoles and self-adjusting insoles on plantar pressure in persons with diabetes mellitus and loss of protective sensation

Malki A, Badaya M.B., Dekker R, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111077.

[**Introduction:** Rocker shoes and insoles reduce peak pressure (PP) in persons with diabetes (DM) and loss of protective sensation (LOPS). However, they are handmade, leading to inconsistent effectiveness. If foot structure changes over time, high PP-locations also change. To address this, individualized algorithm based 3D-printed rockers and self-adjusting pressure-reducing insoles are applied.]

Health-related quality of life in people with different diabetes-related foot ulcer health states: A cross-sectional study of healed, non-infected, infected, hospitalised and amputated ulcer states

Byrnes J, Ward L, Jensen S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111061.

[**Aims:** Diabetes-related foot ulcers (DFU) are a leading cause of infection, hospitalisation and amputation. However, to our knowledge no studies have compared the health-related quality of life (HRQoL) of people with DFU that were infected, hospitalised or amputated. This study aimed to investigate and compare the HRQoL of different groups of people with healed, non-infected, infected, hospitalised, or amputated DFU.]

Impact of diabetes on medical costs in the pre- and postoperative year of lower extremity amputations in Belgium

Lauwers P, Hendriks J.M.H., Wouters K, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111072.

[**Aims:** To compare the medical costs of individuals undergoing lower extremity amputation (LEA) in Belgium with those of amputation-free individuals.]

The International Working Group on the Diabetic Foot: Stories and Numbers Behind Three Decades of Evidence-Based Guidelines for the Management of Diabetes-Related Foot Disease

Van Netten J.J., Apelqvist J, Bus S.A., et al. *Diabetes Therapy* 2024, 15(1): 19-31.

[Foot disease is a devastating complication of diabetes. For almost 3 decades, the mission of the International Working Group on the Diabetic Foot (IWGDF) is to produce evidence-based guidelines to inform health care providers worldwide on strategies for the prevention and management of diabetes-related foot disease. In this publication, we aim to better inform the reader about 'the story behind' the IWGDF Guidelines and thus facilitate improved uptake of the recommendations described in the guidelines. The first IWGDF Guidelines were published in 1999, and these have been successfully updated every 4 years since. With each update, IWGDF has improved the methodological rigour and extended the topics covered. This has been possible thanks to the involvement of > 100 experts from > 60 countries, all voluntarily dedicating their time. We estimate that the 2023 update of the IWGDF Guidelines required a total 10 years of full-time work, which would have cost 2 million euros if the voluntary work had been financially compensated. The IWGDF Guidelines are not only published in English but also translated to support local implementation. Currently available translations serve 2.9 billion people globally in their native language. As an independent and multidisciplinary organisation, IWGDF hopes that the 2023 update will continue to stimulate clinicians from all different disciplines to deliver the best care possible for these patients, will motivate researchers to undertake the high-quality trials needed to deliver the new evidence to advance the field further, and collectively will support people with diabetes-related foot disease to minimize their disease burdens.]

Lower extremity arterial plaque in patients with type 2 diabetes mellitus: A cross-sectional study of 25-(OH)D 3 and other risk factors

Hang X, Yu X, Fan S. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108665.

[**Objective:** The occurrence of chronic vascular complications in individuals with type 2 diabetes mellitus (T2DM) is influenced by multiple factors. This study aims to analyze the correlation between serum 25-(OH)D 3 levels and other risk factors with the formation and severity of arterial plaques in the lower extremities, and explore its role in clinical diagnosis and treatment.]

A novel approach for diabetic foot diagnosis: Deep learning-based detection of lower extremity arterial stenosis

Wu C, Xu C, Ou S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111032.

[**Purpose of the study:** Assessing the lower extremity arterial stenosis scores (LEASS) in patients with diabetic foot ulcer (DFU) is a challenging task that requires considerable time and efforts from physicians, and it may yield varying results. The presence of vascular wall calcification and other irrelevant tissue information surrounding the vessel can further compound the difficulties of this evaluation. Automatic detection of lower extremity arterial stenosis (LEAS) is expected to help doctors develop treatment plans for patients faster.]

Roles and mechanisms of umbilical cord mesenchymal stem cells in the treatment of diabetic foot: A review of preclinical and clinical studies

Zhang H, Gu Y, Zhang K, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108671.

[**Aims:** Growing preclinical and clinical evidence has suggested the potential method of umbilical cord mesenchymal stem cell (UCMSC) therapy for diabetic foot. Thus, the authors provided an outline of the

application of UCMSCs in the treatment of diabetic foot and further summarized the roles and mechanisms of this therapy.]

Von Willebrand factor hyperactivity affects the outcome of lower limb revascularization in subjects with type 2 diabetes mellitus complicated by diabetic foot vasculopathy: An observational pilot study

Pitocco D, Popolla V, Rizzi A, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108653.

[Aim of this study is to evaluate any differences in VWF antigen, VWF activity and ADAMTS-13 activity before and after successful and non-successful Percutaneous Transluminal Angioplasty (PTA) in subjects with type 2 diabetes (T2DM) complicated by Chronic limb-threatening ischemia (CLTI) in diabetic foot vasculopathy.]

Diabetes and pregnancy

Articles

Adverse perinatal outcomes in gestational diabetes mellitus with and without SARS-CoV-2 infection during pregnancy: results from two nationwide registries in Germany

Liedtke T.P., Weber K.S., Adamczewski H, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003724

[**Introduction:** Pregnancy is a known independent risk factor for a severe course of COVID-19. The relationship of SARS-CoV-2 infection and gestational diabetes mellitus (GDM) on neonatal outcomes is unclear. Our aim was to determine if SARS-CoV-2 infection represents an independent risk factor for adverse perinatal outcomes in pregnancy with GDM.]

Association of GLP-1 secretion with parameters of glycemic control in women after gestational diabetes mellitus

Pappa E, Busygina K, Harada S, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003706

[**Introduction:** Women with a history of gestational diabetes mellitus (GDM) are at high risk of developing type 2 diabetes, while the exact mechanisms underlying its pathophysiology are still unclear. We investigated the association of glucagon-like peptide-1 (GLP-1) response to oral glucose with parameters of glycemic control in women with previous GDM in the prospective PPSDiab (Prediction, Prevention, and Subclassification of Type 2 Diabetes) study.]

Combined impact of Hepatitis B virus and gestational diabetes mellitus on ultrasound-measured fetal growth and adverse perinatal outcomes: A seven-year retrospective study

Tu Y, Li Y, Fan X, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111092.

[**Aims:** To investigate the impact of pregnancy with combined hepatitis B virus (HBV) infection and Gestational diabetes mellitus (GDM) on fetal growth and adverse perinatal outcomes.]

Functional analysis of daily glycemic profiles and excessive fetal growth in pregnant patients with well-controlled type 1 diabetes: Retrospective cohort

Sibiak R, Mantaj U, Gutaj P, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111088.

[**Aims:** The study objective was to compare daily glycemic profiles throughout gestation between the mothers of large-for-gestational-age (LGA) and non-LGA newborns in patients with type 1 diabetes (T1D).]

The hidden treasure of gestational diabetes-mediated myocardial function

Costa J.A., Mambié M, Verd S. *Diabetes Research and Clinical Practice* 2024, 207: 111049.

[An increasing number of studies [1] have addressed impaired subclinical ventricular function or pulmonary vascular resistance beyond the early newborn period in infants of mothers with gestational diabetes (GDM). We would like to highlight how this kind of pioneering research overlaps research focusing on the role of human milk feeding (HM) on cardiac maturation in the short to medium term.]

Impact of carbohydrate quantity and quality on maternal and pregnancy outcomes in gestational diabetes mellitus: A systematic review and meta-analysis

Wong M.M.H., Chan M.Y.M., Ng T.P., et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102941.

[**Objective:** To evaluate the impact of carbohydrate quantity and quality on maternal and pregnancy outcomes in gestational diabetes mellitus.]

Increased glycemic variability in pregnant women with Roux-en-Y gastric bypass compared with sleeve gastrectomy

Alexiadou K, Ansari S, Jones B, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003642

[**Introduction:** Bariatric surgery is associated with adverse pregnancy outcomes such as reduced birth weight and premature birth. One possible mechanism for this is increased glycemic variability (GV) which occurs after bariatric surgery. The objective of this study was to compare the effect of Roux-en-Y gastric bypass (RYGB) versus vertical sleeve gastrectomy (SG) on GV during pregnancy and to investigate the relationships of GV, type of bariatric surgery and maternal and neonatal outcomes.]

Is a new discussion about diagnosis of gestational diabetes needed?

Desoye G, Van Poppel M. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.11-12.

[Gestational diabetes is a metabolic condition occurring in pregnant women, usually diagnosed between 24 weeks and 28 weeks of gestation. This timing was chosen to strike a balance between optimising sensitivity and allowing the opportunity to manage metabolic dysregulation through lifestyle or pharmaceutical intervention, if necessary.]

Prevalence and treatment of gestational diabetes in Norway 2010–2020

Kjerpeseth L.J., Hjellvik V, Gulseth H.L., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111025.

[**Aims:** Estimate prevalence of gestational diabetes mellitus (GDM) and its treatment in Norway 2010–2020 and explore impact of new national GDM guidelines in 2017.]

Diabetes mellitus Type 1

Articles

Assessing the uptake of the type 1 diabetes core outcome set in randomized controlled trials: A Cross-Sectional study

Kari K, Thayani Z, Ward S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111085.

[**Aims:** This study analyzed uptake of the core outcome set (COS) for type 1 diabetes (T1D) and trends in its use before and after its development in December 2017.]

Diabetic ketosis vs ketoacidosis as initial presentation of pediatric type 1 diabetes mellitus. Associated features and rate of progression during the first two years after diagnosis

Giannakopoulos A, Chrysanthakopoulou N, Efthymiadou A, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108667.

[**Aims:** In this study we described the clinical and laboratory features of children presented with diabetic ketosis or diabetic ketoacidosis at diagnosis of type 1 diabetes (T1DM) and evaluated its course up to 2 years after initial diagnosis to investigate the progression rate of T1DM in both groups.]

Eating behaviors and estimated body fat percentage among adolescents with type 1 diabetes

Tran T, Igudesman D, Burger K, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111070.

[**Aims:** Estimate associations between select eating behaviors and estimated body fat percentage (eBFP) and explore effect modification by sex among adolescents with type 1 diabetes (T1D).]

The Hybrid Closed-Loop System Tandem t:slim X2™ with Control-IQ Technology: Expert Recommendations for Better Management and Optimization

Chico A, Moreno-Fernández J, Fernández-García D, et al. *Diabetes Therapy* 2024, 15(1): 281-295.

[Technological advances in the management of diabetes, especially type 1 diabetes (T1D), have played a main role in significantly improving glycemic control of these patients in recent years. Undoubtedly, the most important advance has been the commercialization of hybrid closed-loop systems (HCL). Their effectiveness places them in the different guidelines from scientific societies as the gold standard for the treatment of people with T1D. However, obtaining the maximum performance from these systems requires a degree of expertise from the professionals who care for these patients. Specifically, the Tandem X2:slim with Control-IQ technology system, due to its features and configuration options and adjustments, allows T1D patients to better adapt the management of diabetes to multiple circumstances in their day-to-day life. It is necessary, however, to follow a systematic process to start the system and also for the subsequent follow-up, which allows its optimization in the shortest possible time. This expert recommendation reviews the main features of this HCL system, suggesting how to implement it and optimize its use after gaining experience treating many patients.]

Incidence and trends of type 1 diabetes before and after 2000 in the Western Pacific Region: A systematic review and meta-analysis

Wang D, Hou X, Huang J, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111055.

[**Objectives:** To undertake a systematic review of publications describing Type 1 diabetes (T1DM) incidence, trends over time and associated factors in the Western Pacific Region (WPR).]

Incidence, prevalence, and mortality of type 1 diabetes in children and youth in Burkina Faso 2013-2022

Sagna Y, Bagbila W.P.A.H., Sawadogo N, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111086.

[**Aim:** There are no data on type 1 diabetes (T1D) incidence and prevalence in Burkina Faso. We aimed to determine these in persons aged <25 years (y) since the implementation of Life for a Child (LFAC) program in 2013.]

Impact of 6-months of an advanced hybrid closed-loop system on sleep and psychosocial outcomes in youth with type 1 diabetes and their parents

Cobry E.C., Pyle L, Karami A.J., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111087.

[**Introduction:** Youth with type 1 diabetes (T1D) and parents experience reduced quality of life and sleep quality due to nocturnal monitoring, hypoglycemia fear, and diabetes-related disruptions. This study examined the sleep and quality of life impact of advanced technology.]

“It changed everything we do”: A mixed methods study of youth and parent experiences with a pilot exercise education intervention following new diagnosis of type 1 diabetes

Tanenbaum M.L., Addala A, Hanes S, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108651.

[**Aims:** This pilot study delivered a comprehensive exercise education intervention to youth with new-onset type 1 diabetes (T1D) and their parents to increase knowledge and confidence with physical activity (PA) shortly after diagnosis.]

Ketone production and excretion even during mild hyperglycemia and the impact of sodium-glucose co-transporter inhibition in type 1 diabetes

Scarr D, Lovblom E, Ye H, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111031.

[**Aims:** We aimed to determine if ketone production and excretion are increased even at mild fasting hyperglycemia in type 1 diabetes (T1D) and if these are modified by ketoacidosis risk factors, including sodium-glucose co-transporter inhibition (SGLTi) and female sex.]

The Lancet Diabetes & Endocrinology Commission on type 1 diabetes: looking back to move forward

Beran D, Koch M, Ajmal S, et al. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.9-11.

[Kofi Annan, former UN Secretary General and Nobel Prize winner, was noted for his many words of wisdom, including: “One has to learn from history. Quite frankly, it is almost impossible to have a sense of vision without a sense of history. If history is learned, then it doesn't have to repeat itself over generations.” ¹]

Maintaining the gluten-free diet: The key to improve glycemic metrics in youths with type 1 diabetes and celiac disease

Mozzillo E, Marigliano M, Cuccurullo I, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111074.

[**Aims:** Gluten-free diets (GFD) were considered as high glycemic index and/or high content of saturated fats; this could affect keeping good metabolic control in individuals with both type 1 diabetes (T1D) and celiac disease (CD). Our objective was to analyze time in range and other continuous glucose monitoring (CGM) metrics with real-time CGM systems, in youths with T1D and CD, compared to those with T1D only.]

A matched cohort study evaluating the risks of infections in people with type 1 diabetes and their associations with glycosylated haemoglobin

Chaudhry U.A.R., Carey I.M., Critchley J.A., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111023.

[**Aims:** People with type 1 diabetes (T1D) have raised infection rates compared to those without, but how these risks vary by age, sex and ethnicity, or by glycosylated haemoglobin (HbA1c), remain uncertain.]

Midnight Cortisol is Associated with Changes in Systolic Blood Pressure and Diabetic Neuropathy in Subjects with Type 1 Diabetes Undergoing Simultaneous Kidney-Pancreas Transplantation

Boswell L, Amor A.J., Montagud-Marrahi E, et al. *Diabetes Therapy* 2024, 15(1): 165-181.

[**Introduction:** An increased midnight cortisol (MC) has been described in end-stage kidney disease (ESKD) and type 1 diabetes (T1D). Lower circulating levels of the cytokine soluble tumor necrosis factor (TNF)-like weak inducer of apoptosis (sTWEAK) have been found in T1D and ESKD and associated with cardiovascular (CV) events in the latter. We aimed to study MC and sTWEAK in simultaneous pancreas-kidney transplant (SPKT) recipients, and the association of these markers with CV risk factors and transplant outcomes.]

Screening type 1 diabetes and celiac disease by law

Bosi E, Catassi C. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.12-14.

[On Sept 17, 2023, the Italian Parliament approved with unanimous vote a law (Italian Republic Law 130/2023) introducing a nationwide screening for type 1 diabetes and coeliac disease in the general population aged 1–17 years as part of the public health program aimed at reducing the effects of these chronic diseases. This law was successfully passed because of the commitment of many people from the diabetes and scientific community and was advocated for by Fondazione Italiana Diabete.]

What's New in Diabetes Mellitus from UpToDate

Janus kinase inhibition to preserve insulin secretion in early onset type 1 diabetes (January 2024)

In type 1 diabetes, the janus kinase (JAK)/signal transducer and activator of transcription (STAT) pathway has been implicated in immune-mediated beta cell destruction. In a trial in 91 individuals (aged 10 to 30 years) with new-onset type 1 diabetes (diagnosed within 100 days), participants were randomly assigned to daily treatment with the oral JAK1/2 inhibitor baricitinib (n = 60) or placebo (n = 31) [9]. After 48 weeks of therapy, insulin secretion was greater with baricitinib compared with placebo (median stimulated mean C-peptide level 0.65 versus 0.43 nmol/L per minute, respectively). A1C, frequency of hypoglycemia, and the percentage of time spent in the target glucose range (70 to 180 mg/dL [3.9 to 10 mmol/L]) were not significantly different between groups. JAK/STAT pathway inhibition is a promising strategy for preserving insulin secretion in new-onset type 1 diabetes.

Diabetes mellitus Type 2

Articles

Albuminuria and Serum Tumor Necrosis Factor Receptor Levels in Patients with Type 2 Diabetes on SGLT2 Inhibitors: A Prospective Study

Otoda T, Sekine A, Uemoto R, et al. *Diabetes Therapy* 2024, 15(1): 127-143.

[**Introduction:** Large-scale clinical trials of sodium-glucose cotransporter 2 inhibitors (SGLT2i) demonstrate proteinuria-reducing effects in diabetic kidney disease, even after treatment with renin-angiotensin inhibitors. The precise mechanism for this favorable effect remains unclear. This prospective open-label single-arm study investigated factors associated with a reduction in proteinuria after SGLT2i administration.]

Association of urinary albumin-to-creatinine ratio with cardiometabolic risk markers and pre-diabetes in adults with normoglycemia, normoalbuminuria, and normotension with parental type 2 diabetes

Everett M, Rushing N, Asuzu P, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003609

[**Introduction:** This is a post hoc analysis of urinary albumin-to-creatinine ratio (uACR) within the normoalbuminuric range in relation to cardiometabolic risk factors among initially normoglycemic, normotensive participants in the Pathobiology of Prediabetes in a Biracial Cohort (POP-ABC) Study.]

COX2 inhibitor use and type 2 diabetes treatment intensification: A registry-based cohort study

Tan G.S.Q., Morton J.I., Wood S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111082.

[**Aim:** This study examined the association between cyclooxygenase-2 inhibitor (COX2i) use and diabetes progression in people with type 2 diabetes.]

Effectiveness of SARS-CoV-2 primary vaccines and boosters in patients with type 2 diabetes mellitus in Hungary (HUN-VE 4 Study)

Molnár G.A., Vokó Z, Sütő G, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003777

[**Introduction:** Type 2 diabetes mellitus is a risk factor for severe COVID-19 infection and is associated with increased risk of complications. The present study aimed to investigate effectiveness and persistence of different COVID vaccines in persons with or without diabetes during the Delta wave in Hungary.]

GLP-1 receptor agonists, SGLT2 inhibitors and noncardiovascular mortality in type 2 diabetes: Insights from a meta-analysis

Banerjee M, Pal R, Maisnam I, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102943.

[**Objective:** Type-2 diabetes (T2D) poses a higher risk of noncardiovascular mortality in addition to the burden of cardiovascular mortality. The well-established cardiovascular benefits of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and sodium-glucose cotransporter-2 inhibitors (SGLT2i) could solely explain their apparent effects on all-cause mortality in T2D. The present meta-analysis aims to pool their effects on noncardiovascular mortality in T2D and summarize the recent evidence on plausible pathways mediating these effects.]

Incident dementia risk among patients with type 2 diabetes receiving metformin versus alternative oral glucose-lowering therapy: an observational cohort study using UK primary healthcare records

Doran W, Tunnicliffe L, Muzambi R, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003548

[**Introduction:** 4.2 million individuals in the UK have type 2 diabetes, a known risk factor for dementia and mild cognitive impairment (MCI). Diabetes treatment may modify this association, but existing evidence is conflicting. We therefore aimed to assess the association between metformin therapy and risk of incident all-cause dementia or MCI compared with other oral glucose-lowering therapies (GLTs).]

Inflammation mediated by cytotoxic lymphocytes is associated with diabetes duration

Gašparini D, Wensveen F.M., Wensveen T.T. *Diabetes Research and Clinical Practice* 2024, 207: 111056.

[**Aims:** Inflammation, the age-related systemic increase of proinflammatory factors, has been linked to the development of cardiovascular disease, chronic kidney disease and cancer in the elderly. Chronic inflammation is believed to be a causative factor in the development of diabetic complications. However, exactly how type 2 diabetes impacts the inflammatory state of the immune system is incompletely characterised.]

Interplay of heart rate variability and resting heart rate on mortality in type 2 diabetes

Huang Y, Xie P, Zhang S, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102930.

[**Aims:** Heart rate variability (HRV) and resting heart rate (RHR) are usually analyzed and interpreted separately. We aimed to assess the interplay of HRV and RHR on mortality in type 2 diabetes.]

Prevalence of Metabolic Syndrome in Patients with Type 2 Diabetes in Japan: A Retrospective Cross-Sectional Study

Ishigaki Y, Hirase T, Pathadka S, et al. *Diabetes Therapy* 2024, 15(1): 245-256.

[**Introduction:** Recent data on the prevalence of metabolic syndrome in Japanese patients with type 2 diabetes (T2D) are limited.]

Prolonged hospitalization and 1-year mortality are associated with sarcopenia and malnutrition in older patients with type 2 diabetes: A prospective cohort study

Beretta M.V., De Paula T.P., Da Costa Rodrigues T, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111063.

[**Aim:** To assess the relationship of the presence of sarcopenia and malnutrition with unfavorable clinical outcomes: prolonged length of hospital stay (LOS), readmission, and one-year mortality in older patients with type 2 diabetes (T2D).]

Secondary analysis of newly diagnosed type 2 diabetes subgroups and treatment responses in the MARCH cohort

Wang W, Li X, Chen F, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102936.

[**Objective:** To incorporate new clusters in the MARCH (Metformin and AcaRbose in Chinese patients as the initial Hypoglycemic treatment) cohort of newly diagnosed type 2 diabetes (T2D) patients and compare the anti-glycemic effects of metformin and acarbose across different clusters.]

Study Protocol for the Pleiotropic Effects of Sodium-Glucose Cotransporter 2 Inhibitor on Organ-Specific Sympathetic Nerve Activity and Insulin Sensitivity in Participants with Type 2 Diabetes

Takeshita Y, Nomura C, Murai H, et al. *Diabetes Therapy* 2024, 15(1): 269-280.

[**Introduction:** Hyperinsulinemia and hyperglycemia are associated with exaggerated systemic sympathetic nerve activity (SNA) in patients with type 2 diabetes. Sodium-glucose cotransporter 2 (SGLT2) inhibitors lower insulin levels, whereas sulfonylureas increase insulin levels. We will test whether these two classes of antidiabetic agents have different effects on SNA.]

Telehealth Use and Healthcare Utilization Among Individuals with Type 2 Diabetes During the COVID-19 Pandemic: Evidence From Louisiana Medicaid Claims

Shao Y, Shi L, Nauman E, et al. *Diabetes Therapy* 2024, 15(1): 229-243.

[**Introduction:** The impact of telehealth use on healthcare utilization is limited, especially among Medicaid beneficiaries with type 2 diabetes. Considering the rapid adoption of telehealth during the COVID-19 pandemic, this study examined associations between telehealth use and healthcare utilization among Medicaid beneficiaries with type 2 diabetes.]

Diagnosis

Articles

Breath-based biosensors and system development for noninvasive detection of diabetes: A review

Jadhav M.R., Wankhede P.R., Srivastava S, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102931.

[**Background and aims:** In recent years, noninvasive techniques are becoming conspicuous for diabetes detection. Sweat, tear, saliva, urine and breath-based methods showing prominent results in breath acetone detection which is considered as a biomarker of diabetes. A concrete relationship between breath acetone and BG helps in the development of devices for diabetes detection.]

Is the Current Cut Point for Glycated Haemoglobin (HbA1c) Correct for Diagnosing Diabetes Mellitus in Premenopausal Women? Evidence to Inform Discussion

Holland D, Fryer A.A., Stedman M, et al. *Diabetes Therapy* 2024, 15(1): 99-110.

[Introduction: Women are on average diagnosed with diabetes mellitus at later age than men but have higher mortality. As the diagnosis of diabetes mellitus is primarily based on HbA1c, the use of a non-specific reference range and cut point for diabetes mellitus that does not account for gender differences in diabetes could potentially lead to underdiagnosis of diabetes mellitus in women and missed opportunities for intervention. We investigated whether a contributing factor to the later diagnosis in women may be a difference in distribution of HbA1c in premenopausal women versus men of the same age by comparing HbA1c values in men and women across multiple sites in the UK.]

Potency of quality indicators in Dutch and international diabetes registries

Bak J.C.G, Serné E.H., Wouters M.W.J.M., et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102920.

[Background: Diabetes mellitus forms a slow pandemic. Cardiovascular risk and quality of diabetes care are strongly associated. Quality indicators improve diabetes management and reduce mortality and costs. Various national diabetes registries render national quality indicators. We describe diabetes care indicators for Dutch children and adults with diabetes, and compare them with indicators established by registries worldwide.]

Glucose monitoring and control

Articles

Association between brain imaging biomarkers and continuous glucose monitoring-derived glycemic control indices in Japanese patients with type 2 diabetes mellitus

Inoue C, Kusunoki Y, Ohigashi M, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003744

[Introduction: Although type 2 diabetes mellitus (T2DM) is associated with alterations in brain structure, the relationship between glycemic control indices and brain imaging markers remains unclear. This study aimed to investigate the association between continuous glucose monitoring (CGM)-derived glycemic control indices and brain imaging biomarkers assessed by MRI.]

Association of insulin resistance and glycemic measures with major abnormal electrocardiogram in older Chinese: Cross-sectional analysis based on the Guangzhou Biobank Cohort study

Tian W.B., Zhang W.S., Jiang C.Q., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111046.

[Aims: To examine whether insulin resistance (IR) and glycemic measures were associated with major abnormal electrocardiogram (MA-ECG) and its specific abnormalities in the general population.]

A conceptual model of the continuous glucose monitoring integration process for older adults with diabetes developed using participatory systems science methods

Smith C, Sarteau A.C., Qu X, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111053.

[Aims: Continuous glucose monitoring (CGM) use remains low in older adults. We aimed to develop a conceptual model of CGM integration among older adults with type 1 and type 2 diabetes.]

The effects of pomegranate consumption on glycemic indices in adults: A systematic review and meta-analysis

Bahari H, Ashtary-Larky D, Goudarzi K, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102940.

[Background and aim: Epidemiologic studies have shown that type 2 diabetes (T2D) is more prevalent worldwide; therefore, improving glycemic indices to prevent or control T2D is vital. Randomized controlled trials (RCTs) on the effects of pomegranate consumption on glycemic indices have shown inconsistent results. Therefore, we aim to evaluate the impact of pomegranate

consumption on fasting blood glucose (FBG), fasting insulin, hemoglobin A1c (HbA1c), and Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) in adults.]

Glucose control during breakthrough SARS-CoV-2 infections in vaccinated patients with type 1 diabetes

Longo M, Scappaticcio L, Signoriello S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111044.

[**Aims:** This study aims at evaluating the trend of glycemic control metrics during the infection of SARS-CoV-2 in individuals with Type 1 Diabetes (T1D) using a Continuous Glucose Monitoring (CGM) system and vaccinated against COVID-19.]

Incident dementia risk among patients with type 2 diabetes receiving metformin versus alternative oral glucose-lowering therapy: an observational cohort study using UK primary healthcare records

Doran W, Tunnicliffe L, Muzambi R, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003548

[**Introduction:** 4.2 million individuals in the UK have type 2 diabetes, a known risk factor for dementia and mild cognitive impairment (MCI). Diabetes treatment may modify this association, but existing evidence is conflicting. We therefore aimed to assess the association between metformin therapy and risk of incident all-cause dementia or MCI compared with other oral glucose-lowering therapies (GLTs).]

Institutional experience on the impact of glucagon-like peptide-1 agonists (GLP-1) on glycemic control and weight loss in patients with type 2 diabetes at the Dubai Diabetes Center, United Arab Emirates

Abdelmannan D, AlBuflasa M, Ajlouni H, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111045.

[**Aims:** To describe the effect of three classes of GLP1 analogues on HbA1c and weight over one year in a homogenous group of patients at the Dubai Diabetes Center in Dubai, United Arab Emirates. The specific objectives are to study the extent of change in HbA1c and weight loss on these medications as well as the sustainability of change over one year.]

Intra-pancreatic fat is associated with high circulating glucagon and GLP-1 concentrations following whey protein ingestion in overweight women with impaired fasting glucose: A randomised controlled trial

Lim J.J., Sequeira-Bisson I.R., Yip W.C.Y., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111084.

[**Aim:** Intra-pancreatic fat deposition (IPFD) while hypothesised to impair beta-cell function, its impact on alpha-cells remains unclear. We evaluated the association between IPFD and markers of pancreatic cells function using whey protein.]

Phase 3 efficacy and safety trial of proposed liraglutide biosimilar for reduction of glycosylated hemoglobin (HbA1c) in patients with Type 2 diabetes mellitus

Krishnan K, Raman S, Anand Moses C.R., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111034.

[Liraglutide is indicated for glycaemic control in adults with Type 2 diabetes mellitus (T2DM) as an adjunct to diet and exercise. A proposed biosimilar of liraglutide (Levim Liraglutide) was investigated for efficacy & safety in a phase 3 study against the originator reference liraglutide (Victoza®) manufactured by Novo Nordisk A/S, Denmark. Patients aged 18–65 years of age with glycosylated hemoglobin (HbA1c) between 7 and 10 %, among other criteria, were included in the study. Patients were randomized 1:1 to receive daily doses of either Levim liraglutide or reference liraglutide for 24 weeks. The least square mean (standard error, SE) for the primary efficacy endpoint of reduction in HbA1c% at Week 24 was –1.09 (0.15) % for Levim liraglutide group and –1.04 (0.14) % for reference liraglutide.

The upper bound of the confidence interval for treatment difference was less than the non-inferiority margin of 0.4 % at one-sided alpha of 0.025 (P-value = 0.0003). The secondary endpoints for proportion of patients achieving reduction in HbA1c, glycaemic level and weight, changes in cardiovascular parameters and the overall safety profiles of the study drugs were comparable. Levim liraglutide demonstrated non-inferior efficacy and similar safety to reference liraglutide and may be an option in treatment of T2DM (CTRI.nic.in, no. CTRI/2022/02/040261).]

Hyperglycaemia

Articles

Ketone production and excretion even during mild hyperglycemia and the impact of sodium-glucose co-transporter inhibition in type 1 diabetes

Scarr D, Lovblom E, Ye H, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111031.

[**Aims:** We aimed to determine if ketone production and excretion are increased even at mild fasting hyperglycemia in type 1 diabetes (T1D) and if these are modified by ketoacidosis risk factors, including sodium-glucose co-transporter inhibition (SGLTi) and female sex.]

U-shaped association between stress hyperglycemia ratio and risk of all-cause mortality in cardiac ICU

Li L, Ding L, Zheng L, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102932.

[**Background:** Stress hyperglycemia has been associated with poor prognosis in patients admitted to the cardiac intensive care unit (ICU). Recently, the stress hyperglycemia ratio (SHR) has been proposed to reflect true acute hyperglycemic. This study aimed to investigate the relationship between SHR and prognosis of patients in the cardiac ICU.]

Hypoglycaemia

Articles

Effectiveness of interventions for emergency care of hypoglycaemia and diabetic ketoacidosis: A systematic review

Maharjan J, Pandit S, Johansson K.A., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111078.

[**Aim:** This systematic review aims to provide evidence on effectiveness of interventions used in emergency care of hypoglycaemia and diabetic ketoacidosis (DKA).]

Potential risk factors for mild cognitive impairment among patients with type 2 diabetes experiencing hypoglycemia

Gao R, Zhan M, Ke S, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111036.

[**Aims:** This study examined the association between hypoglycemia and mild cognitive impairment (MCI) among patients with type 2 diabetes mellitus (T2DM) and identified risk factors for MCI in patients with hypoglycemia.]

Articles

Association of insulin resistance and glycemic measures with major abnormal electrocardiogram in older Chinese: Cross-sectional analysis based on the Guangzhou Biobank Cohort study

Tian W.B., Zhang W.S., Jiang C.Q., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111046.

[**Aims:** To examine whether insulin resistance (IR) and glycemic measures were associated with major abnormal electrocardiogram (MA-ECG) and its specific abnormalities in the general population.]

Fasting and postprandial plasma glucose contributions to hemoglobin A1c and time in range in people with diabetes on multiple daily injection insulin therapy: Results from the PRONTO-T1D and PRONTO-T2D clinical trials

De Oliveira C.P., Dellva M.A., Bue-Valleskey J, et al. *Journal of Diabetes and Its Complications*, 2024, 38(1), Article 108648.

[**Aims:** To investigate contributions of changes in fasting plasma glucose (FPG) and postprandial glucose (PPG) to changes in hemoglobin A1c (HbA1c) and time-in-range (TIR, 70–180 mg/dL) in people with type 1 diabetes (T1D) and type 2 diabetes (T2D) treated with multiple daily injections (MDI) of insulin lispro (rapid/ultra-rapid formulations).]

Machine learning-based prediction of medication refill adherence among first-time insulin users with type 2 diabetes

Chen Y.L., Nguyen P.A., Chien C.H., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111033.

[**Aims:** The prevalence of Type 2 Diabetes Mellitus (T2DM) is projected to be 7 % in 2030. Despite its need for long-term diabetes care, the adherence rate of injectable medications such as insulin is around 60 %, lower than the acceptable threshold of 80 %. This study aims to create classification models to predict insulin adherence among adult T2DM naïve insulin users.]

Should insulin resistance (HOMA-IR), insulin secretion (HOMA-β), and visceral fat area be considered for improving the performance of diabetes risk prediction models

Hu H, Nakagawa T, Honda T, et al. *BMJ Open Diabetes Research and Care* 2024;12:e003680

[**Introduction:** Insulin resistance and defects in pancreatic beta cells are the two major pathophysiologic abnormalities that underlie type 2 diabetes. In addition, visceral fat area (VFA) is reported to be a stronger predictor for diabetes than body mass index (BMI). Here, we tested whether the performance of diabetes prediction models could be improved by adding HOMA-IR and HOMA-β and replacing BMI with VFA.]

South Africa to produce insulin for Africa in 2024

Makoni M. *Lancet Diabetes & Endocrinology*, 2024, 12(1), p.18.

[A collaboration between a global leader in diabetes research and innovation (Novo Nordisk) and Africa's largest pharmaceutical manufacturer (Aspen) will result in the production of human insulin in South Africa in 2024 to cater for people with diabetes across the continent. Aspen was contracted by Novo Nordisk, a Danish drugmaker with more than 97 years of experience in innovation and leadership in diabetes care, to commercially manufacture human insulin. The announcement was made at the 78th UN General Assembly (UNGA 78) in New York, NY, USA, on Sept 19, 2023.]

What's New in Diabetes Mellitus from UpToDate

Effect of short-term sleep restriction on insulin sensitivity in females (January 2024)

Short sleep duration has been associated with risk of type 2 diabetes, but whether this reflects a causal relationship is uncertain. In a crossover study in 38 females aged 20 to 75 years with baseline sleep duration of seven to nine hours nightly, participants underwent sequential, six-week phases of sleep maintenance (usual sleep time maintained) and sleep restriction (sleep time reduced by 1.5 hours nightly) [8]. Sleep restriction led to increases in fasting insulin concentration and homeostasis model assessment of insulin resistance (HOMA-IR), indicating diminished insulin sensitivity. These changes were independent of changes in adiposity and were more pronounced in postmenopausal compared with premenopausal participants. Further studies are needed to verify the findings in a larger cohort of patients, including males, and to determine whether prolonged sleep restriction causes progressive worsening of glucose homeostasis.

Janus kinase inhibition to preserve insulin secretion in early onset type 1 diabetes (January 2024)

In type 1 diabetes, the janus kinase (JAK)/signal transducer and activator of transcription (STAT) pathway has been implicated in immune-mediated beta cell destruction. In a trial in 91 individuals (aged 10 to 30 years) with new-onset type 1 diabetes (diagnosed within 100 days), participants were randomly assigned to daily treatment with the oral JAK1/2 inhibitor baricitinib (n = 60) or placebo (n = 31) [9]. After 48 weeks of therapy, insulin secretion was greater with baricitinib compared with placebo (median stimulated mean C-peptide level 0.65 versus 0.43 nmol/L per minute, respectively). A1C, frequency of hypoglycemia, and the percentage of time spent in the target glucose range (70 to 180 mg/dL [3.9 to 10 mmol/L]) were not significantly different between groups. JAK/STAT pathway inhibition is a promising strategy for preserving insulin secretion in new-onset type 1 diabetes.

Management of diabetes (diet, exercise, lifestyle)

Articles

Associations between social determinants of health and diabetes self-care behaviors among insured adult patients

Burch A.E., Elliott S.K., Harris S.T. *Diabetes Research and Clinical Practice* 2024, 207: 111048.

[**Aims:** This study explored the association between social determinants of health (SDOH) and diabetes care behaviors among individuals with health insurance.]

Does a Ketogenic Diet Have a Place Within Diabetes Clinical Practice? Review of Current Evidence and Controversies

Firman C.H., Mellor D.D., Unwin D, et al. *Diabetes Therapy* 2024, 15(1): 77-97.

[Carbohydrate restriction has gained increasing popularity as an adjunctive nutritional therapy for diabetes management. However, controversy remains regarding the long-term suitability, safety, efficacy and potential superiority of a very low carbohydrate, ketogenic diet compared to current recommended nutritional approaches for diabetes management. Recommendations with respect to a ketogenic diet in clinical practice are often hindered by the lack of established definition, which prevents its capacity to be most appropriately prescribed as a therapeutic option for diabetes. Furthermore, with conflicted evidence, this has led to uncertainty amongst clinicians on how best to support and advise their patients. This review will explore whether a ketogenic diet has a place within clinical practice by reviewing current evidence and controversies.]

Optimizing Diabetes Management Using a Low-Calorie Diet in Saudi Arabia: A Cost-Benefit Analysis

Al Sifri S, Aldahash R, De Luis Roman D.A., et al. *Diabetes Therapy* 2024, 15(1): 155-164.

[**Background:** Low-calorie diets, high in protein and low in carbohydrates, are commonly recommended for patients with pre-diabetes and type 2 diabetes. The objective of this study was to carry out a cost-benefit analysis (CBA) of a low-calorie versus a standard diet from the perspective of the Saudi Arabian health system.]

Pilates for people with type 2 diabetes: A systematic review

González-Devesa D, Rodríguez A.O., Blanco-Martínez N, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102922.

[**Introduction:** Type 2 Diabetes (T2D) is a prevalent and significant metabolic disorder that represents a global pandemic and posing a substantial healthcare burden worldwide. The incidence of T2D is on the rise, and it is projected that the number of people with diabetes will surpass 590 million by 2035 [1]. T2D is the result of a complex interplay between genetic factors that affect insulin secretion and insulin resistance, as well as lifestyle factors such as obesity, overeating, and lack of exercise [2].]

A systematic review of associations between day-to-day variability in meal pattern and body weight, components of the metabolic syndrome and cognitive function.

Ali M.A., Macdonald I.A., Taylor M.A. *Journal of Human Nutrition and Dietetics* 2024;37(1):316-353.

[**Background:** Meal pattern is a potential health determinant. Previously, mean values for properties of meal pattern, such as daily meal frequency, have been considered. Means, however, obscure variability between-day (irregular or chaotic eating). This systematic review aimed to identify and critique published methods used to characterise between-day variability in meal pattern, and to explore relationships between this and obesity, as well as associated health outcomes.]

Mental health and diabetes

Websites

Finding balance: managing diabetes and depression with physical activity.

The Mental Elf; 2024.

<https://www.nationalelfservice.net/treatment/exercise/diabetes-depression-physical-activity/>

[Depression is common in people with type 2 diabetes and may exacerbate the illness's complexity and make management more difficult (Pinchevsky et al., 2020; Zhuang et al., 2017). Treatment of depression is essential as part of managing diabetes since it not only impairs glycemic control but also raises the risk of subsequent complications (Hermanns et al., 2013). Furthermore, depression-related reductions in motivation may have an adverse effect on diabetes medication compliance as well as self-management practices including exercise and diet (Petrak and Herpertz, 2009). Treating depression in people with type 2 diabetes is difficult for clinicians because they must strike a balance between their patients' psychological health and the complexities of diabetes-specific guidelines. Treatment plans involving traditional psychotropic drugs may be complex to manage because of the potential for negative effects on blood glucose levels (Davies, 2019; Brandt et al., 2019). In the middle of this intricate relationship, physical activity appears to be a potential solution, as it helps people with type 2 diabetes manage their blood sugar levels and simultaneously reduces depression symptoms. Physical activity may therefore provide a strategy for managing mental health issues and diabetes-related problems (Narita et al., 2019). This systematic review and meta-analysis conducted by Arsh and colleagues (2023) aimed to provide a thorough analyses of the available data regarding the effects of physical activity on depression among people with type 2 diabetes.]

Articles

Antifibrotic effects of sodium-glucose cotransporter-2 inhibitors: A comprehensive review

Shakour N, Karami S, Iranshahi M, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102934.

[**Background and aims:** Scar tissue accumulation in organs is the underlying cause of many fibrotic diseases. Due to the extensive array of organs affected, the long-term nature of fibrotic processes and the large number of people who suffer from the negative impact of these diseases, they constitute a serious health problem for modern medicine and a huge economic burden on society. Sodium-glucose cotransporter-2 inhibitors (SGLT2is) are a relatively new class of anti-diabetic pharmaceuticals that offer additional benefits over and above their glucose-lowering properties; these medications modulate a variety of diseases, including fibrosis. Herein, we have collated and analyzed all available research on SGLT2is and their effects on organ fibrosis, together with providing a proposed explanation as to the underlying mechanisms.]

Case report: Tirzepatide for mitochondrial diabetes mellitus with a mutation at position 3271 and transient GAD antibody positivity

Suzuki Y. *Diabetes Research and Clinical Practice* 2024, 207: 111035.

[**Introduction:** Mitochondrial diabetes mellitus (MDM) is a rare form of diabetes caused by mutations in mitochondrial DNA. MDM is associated with other comorbidities, such as GAD antibody positivity [1]. Tirzepatide is a dual GLP-1 and GIP receptor agonist that is effective in treating type 2 diabetes. Tirzepatide has also an effect on type 2 diabetes patients with GAD antibody positivity [2].]

Combined translational pharmacometrics approach to support the design and conduct of the first-in-human study of DWP16001.

Lee S.J., Bae S.H., Jeon S, et al. *British Journal of Clinical Pharmacology* 2024;90(1):286-298.

[**Aims:** The objective of this study was to characterize the pharmacokinetics (PK)/pharmacodynamics (PD) of DWP16001, a novel sodium–glucose cotransporter 2 inhibitor, and predict efficacious doses for the first-in-human study using various translational approaches.]

Comparative efficacy and safety of probiotics, prebiotics, and synbiotics for type 2 diabetes management: A systematic review and network meta-analysis

Jayedi A, Aletaha A, Zeraattalab-Motlagh S, et al. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 2024;18(1): 102923.

[**Aims:** To compare the effects of probiotics, prebiotics, and synbiotics for type 2 diabetes (T2D) management.]

Comparison of Effects of Injectable Semaglutide and Dulaglutide on Oxidative Stress and Glucose Variability in Patients with Type 2 Diabetes Mellitus: A Prospective Preliminary Study

Omachi T, Ohara M, Fujikawa T, et al. *Diabetes Therapy* 2024, 15(1): 111-126.

[**Introduction:** Recent trials have shown that glucagon-like peptide-1 receptor agonists considerably reduce atherosclerotic cardiovascular disease in patients with type 2 diabetes mellitus (T2DM). Oxidative stress, a surrogate marker of cardiovascular risk, is associated with glucose variability. However, to the best of our knowledge, no studies have compared the effects of injectable semaglutide and dulaglutide therapies on oxidative stress and glucose variability assessed via continuous glucose monitoring (CGM). This study aimed to analyze and compare the effects of semaglutide and dulaglutide therapies on oxidative stress and glucose variability as assessed through CGM.]

Cost-Effectiveness of Pharmacist Care in Diabetes Management: A Systematic Review

Zhu J, Zhou Y, Wang G. *Diabetes Therapy* 2024, 15(1): 61-76.

[**Introduction:** In recent years, the role of pharmacists has undergone significant transformation to become more patient-centered and involved in managing chronic diseases. Nonetheless, it remains unclear whether pharmacist involvement in diabetes management is cost-effective. This study aimed to systematically review the cost-effectiveness and reporting quality in comprehensive economic evaluations of pharmacist management compared to standard care in diabetes.]

Correction to Lancet Diabetes Endocrinol 2023; 11: 905–14

Lancet Diabetes & Endocrinology, 2024, 12(1), e.1.

[*RECOVERY Collaborative Group. Empagliflozin in patients admitted to hospital with COVID-19 (RECOVERY): a randomised, controlled, open-label, platform trial. Lancet Diabetes Endocrinol 2023; 11: 905–14.*]

The effect of metformin on adipokines levels: A systematic review and meta-analysis of randomized-controlled trials

Zhao D, Sohoul M.H., Rohani P, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111076.

[**Background:** Considering the role of adipokine on diseases related to metabolic syndrome and even chronic diseases, it seems necessary to investigate effective interventions on these factors. This study aimed to comprehensively investigate the effects of metformin on adipokines.]

A Multicenter, Randomized, Double-Blind, Placebo-Controlled, and Dose-Increasing Study on the Safety, Tolerability and PK/PD of Multiple Doses of HSK7653 by Oral Administration in Patients with Type 2 Diabetes Mellitus in China

Bai N, Wang J, Liang W, et al. *Diabetes Therapy* 2024, 15(1): 183-199.

[**Introduction:** This study assessed the safety, tolerability, and PK/PD of HSK7653 tablets in Chinese patients with type 2 diabetes mellitus (T2DM).]

New clarity for managing statin intolerance in diabetes

Hegele R.A. *Lancet Diabetes & Endocrinology*, 2024, 12(1), pp.2-3.

[In clinical practice guidelines, diabetes is a statin-indicated condition. ¹ Reducing LDL cholesterol by 1 mmol/L with statin therapy reduces overall mortality by 9% and cardiovascular mortality by 13% in patients with diabetes, ² reinforcing this treatment's foundational role. Non-statin agents that reduce LDL cholesterol, such as ezetimibe and monoclonal antibodies directed against PCSK9, have also shown cardiovascular benefits in patients with diabetes, but only in secondary prevention among those already receiving background statin therapy. ³ Because a small but clinically relevant proportion of patients are unable to tolerate statin therapy, ⁴ the effectiveness of LDL cholesterol reduction by non-statins in the prevention of atherosclerotic cardiovascular disease among patients with diabetes requires evaluation and clarification.]

Perspectives in weight control in diabetes – Survodutide

Klein T, Augustin R, Hennige A.M. *Diabetes Research and Clinical Practice* 2024, 207: 110779.

[Glucagon-like peptide-1 receptor (GLP-1R) agonists are approved treatments for Type 2 diabetes mellitus, with liraglutide and semaglutide also approved for the treatment of obesity. The natural gut hormone oxyntomodulin is a weak dual agonist of the glucagon receptor (GCGR) and GLP-1R. Development of poly-agonists mimicking oxyntomodulin, such as the novel dual GCGR/GLP-1R agonist survodutide, represents an important step towards a more effective treatment for people with Type 2 diabetes mellitus and obesity. Survodutide is a 29-amino acid peptide derived from glucagon, with the incorporation of potent GLP-1 activities. It contains a C18 diacid which mediates binding to albumin, thereby prolonging the half-life to enable once-weekly subcutaneous dosing. The utilisation of

GCGR agonism aims to enhance body weight-lowering effects by increasing energy expenditure in addition to the anorectic action of GLP-1R agonists. Glucose-lowering efficacy of survodutide has been demonstrated in a Phase II trial in patients with Type 2 diabetes mellitus and obesity and was associated with clinically meaningful body weight loss. These data highlight the potential of dual GCGR/GLP-1R agonism for reducing glycosylated haemoglobin and body weight in patients with Type 2 diabetes mellitus, and for greater therapeutic efficacy compared with GLP-1R agonism alone.]

Phase 3 efficacy and safety trial of proposed liraglutide biosimilar for reduction of glycosylated hemoglobin (HbA1c) in patients with Type 2 diabetes mellitus

Krishnan K, Raman S, Anand Moses C.R., et al. *Diabetes Research and Clinical Practice* 2024, 207: 111034.

[Liraglutide is indicated for glycaemic control in adults with Type 2 diabetes mellitus (T2DM) as an adjunct to diet and exercise. A proposed biosimilar of liraglutide (Levim Liraglutide) was investigated for efficacy & safety in a phase 3 study against the originator reference liraglutide (Victoza®) manufactured by Novo Nordisk A/S, Denmark. Patients aged 18–65 years of age with glycosylated hemoglobin (HbA1c) between 7 and 10 %, among other criteria, were included in the study. Patients were randomized 1:1 to receive daily doses of either Levim liraglutide or reference liraglutide for 24 weeks. The least square mean (standard error, SE) for the primary efficacy endpoint of reduction in HbA1c% at Week 24 was –1.09 (0.15) % for Levim liraglutide group and –1.04 (0.14) % for reference liraglutide. The upper bound of the confidence interval for treatment difference was less than the non-inferiority margin of 0.4 % at one-sided alpha of 0.025 (P-value = 0.0003). The secondary endpoints for proportion of patients achieving reduction in HbA1c, glycaemic level and weight, changes in cardiovascular parameters and the overall safety profiles of the study drugs were comparable. Levim liraglutide demonstrated non-inferior efficacy and similar safety to reference liraglutide and may be an option in treatment of T2DM (CTRI.nic.in, no. CTRI/2022/02/040261).]

Potential New Therapeutic Implications of Semaglutide: New Colours of the Rainbow?

Gouveri E, Popovic D.S., Papanas N. *Diabetes Therapy* 2024, 15(1): 13-18.

[Semaglutide is a potent glucagon-like peptide 1 receptor agonist for the management of type 2 diabetes mellitus. In addition to this, it has emerging potential clinical implications. First, there is accumulating preliminary data on its potential role in type 1 diabetes mellitus. In this setting, we need to know which patient subgroups may benefit more. Furthermore, its role in non-alcoholic fatty liver and in non-alcoholic steatohepatitis is emerging. Other potential therapeutic implications of semaglutide include kidney disease, Alzheimer disease and pulmonary diseases. Nonetheless, we still need much more information on its long-term efficacy, safety and utility in these new implications before any definitive conclusions may be drawn for everyday practice.]

A Randomized, Double-Blind, Parallel-Group Phase III Trial Investigating the Glycemic Efficacy and Safety Profile of Fixed-Dose Combination Dapagliflozin and Linagliptin Over Linagliptin Monotherapy in Patients with Inadequately Controlled Type 2 Diabetes with Metformin

Jain A, Vispute A, Dange A, et al. *Diabetes Therapy* 2024, 15(1): 215-227.

[Introduction: The aim of the study was to evaluate the efficacy and safety of fixed-dose combination (FDC) of dapagliflozin (10 mg) and linagliptin (5 mg) in comparison to linagliptin 5 mg (Trajenta) in patients with insufficiently controlled type 2 diabetes mellitus (T2DM) on metformin monotherapy.]

Use of IDegLira to Intensify, Simplify, and Increase Appropriateness of Type 2 Diabetes Therapy: A Real-Life Experience

Romano I, Serra R. *Diabetes Therapy* 2024, 15(1): 145-154.

[Introduction: Fixed ratio combination of insulin degludec and liraglutide (IDegLira) represents an option to revise inappropriate therapies in patients with poorly controlled type 2 diabetes. This study aimed to assess the pattern of use and 1-year effectiveness of IDegLira.]

General

Teenagers with diabetes

Articles

Eating behaviors and estimated body fat percentage among adolescents with type 1 diabetes

Tran T, Igudesman D, Burger K, et al. *Diabetes Research and Clinical Practice* 2024, 207: 111070.

[**Aims:** Estimate associations between select eating behaviors and estimated body fat percentage (eBFP) and explore effect modification by sex among adolescents with type 1 diabetes (T1D).]

Trends and risk factors of diabetes and prediabetes in US adolescents, 1999–2020

Ouyang A, Hu K, Chen L. *Diabetes Research and Clinical Practice* 2024, 207: 111022.

[**Aims:** To assess the national trends in prevalence of diabetes and prediabetes and their major risk factors among adolescents in the US.]