



# EASD ANNUAL CONGRESS 2016

ICM MESSE MÜNCHEN,  
MUNICH, GERMANY  
12<sup>TH</sup>-16<sup>TH</sup> SEPTEMBER 2016

Welcome to the  
*European Medical Journal* review of the 52<sup>nd</sup>  
European Association for the Study of  
Diabetes Annual Meeting

As the location of the head office of the German Center for Diabetes Research (DZD) and the Institute of Diabetes and Regeneration Research (IDR), Munich, Germany, is a key centre for diabetes research. Historically, the city is also linked to diabetes, being the birthplace of celebrated doctor and researcher Dr Siegfried Thannhauser (1885-1962). After receiving his medical degree from the University of Munich in 1910, Dr Thannhauser went on to make significant contributions to the field of diabetes through his research into uric acid, lipids, and glucose metabolism.

Dr Angela Merkel, Federal Chancellor of Germany, greeted the congress, stating that current estimates suggest that 1 in 10 people in Germany will be affected by diabetes mellitus by 2030 if something major does not happen to arrest this trend, highlighting the importance of meetings such as the European Association for the Study of Diabetes (EASD) Annual Meeting to share practice and research among professionals.

Speaking about the growth of the annual meeting, Prof Juleen Zierath, President of the EASD, commented: "We have been around now for 52 years, and our first meeting was held in 1965, and as I understand, there were about 233 delegates coming together in Montecatini, Italy." The President demonstrated on a graph how much the community had grown, noting it had reached a peak of 18,000 delegates in Rome, and stating that currently, there were "somewhere around 15-17,000 delegates coming together once a year for this real, main event in Europe, to acquire new knowledge and advance that knowledge into care." This year's congress saw over 2,000 abstracts submitted, with 1,167 accepted and presented as both poster sessions and short talks. With many of the speakers presenting for the first time, this display of cutting-edge science bodes well for the continued development of the congress.

As is now customary, the EASD Virtual Meeting enabled those who could not attend to freely access and view all presentations from this year's congress, as well as thousands from recent years; updates were made hourly to ensure absentees could catch up with news as quickly as possible. A new addition to the programme

for this year was the introduction of evening symposia to complement the staple industry symposia. These evening symposia events provided additional opportunities for companies to introduce the very latest innovations and forefront products in the field of diabetes.

Several annual prizes were awarded at the congress, with Prof Mark Cooper winning the EASD's most prestigious scientific achievement award: The Claude Bernard Lecturer. This recognises an individual's innovative leadership and their outstanding contributions to the advancement of knowledge in the field of diabetes mellitus and related metabolic diseases. Having won, Prof Cooper then delivered the 48<sup>th</sup> Claude Bernard Lecture titled, 'Uncomplicating diabetes: Interactions between metabolic and haemodynamic signalling pathways in the pathogenesis of diabetic complications'.

For the Award Winners at the 52<sup>nd</sup> EASD Annual Meeting 2016 [click here](#)

“ ...somewhere around 15-17,000 delegates coming together once a year for this real, main event in Europe, to acquire new knowledge and advance that knowledge into care. ”

In this issue of *EMJ Diabetes*, we present reviews of exciting areas of research presented at this year's meetings, allowing you to remain up-to-date with current developments in the field. Topics include: how anabolic steroid use can impair insulin sensitivity, how better glucose control reduces the risk of macro and microvascular events, and how newly diagnosed Type 2 diabetes may prove to be an effective indicator in detecting pancreatic cancer prematurely. We hope that you enjoy this issue and are able to take away valuable insight.

## Congress Highlights



### Interactions Between Obesity Genes and the Environment Increase Weight Risk

OBESITY and Type 2 diabetes are strongly dependent on both genetic and environmental factors. A EASD press release dated 13<sup>th</sup> September 2016 has highlighted key interactions between obesity genes and environmental influences, alluding to the possibility that simply targeting unhealthy food and drink industries may not be the answer.

Despite agreement that the struggle to lose and/or maintain a healthy weight for some may be caused by 'bad' genes, the impact of external factors is currently unknown. Research presented at EASD suggests that although low levels of activity and high calorie intake do increase our obesity risk, socio-economic status may be the best indicator of risk.

“ ...public health measures aiming to alter all aspects of the obesogenic environment in small ways may have more impact in lowering the prevalence of obesity and Type 2 diabetes than targeting a single or few aspects. ”

Utilising data from the UK Biobank, a major national healthcare cohort employed by many research groups, Prof Timothy Frayling and Dr Jess Tyrrell, University of Exeter Medical School, University of Exeter, Exeter, UK, and colleagues, compared incidence rates, high-risk obesogenic environmental factors, and obesity genes in 120,000 individuals. Distinctly from other studies of the same nature, 69 genetic variants were compared with 12 environmental measures including television viewing times, duration of inactivity, physical activity with strenuous activity noted, protein and fat diet content, fried food and fizzy drink consumption, and socio-economic status. BMI was used to determine the clinical level of obesity as standard.

Results showed that the most reflective external factor contributing to the population's risk of obesity was socio-economic status. The relative poverty of individuals positive for obesity genes correlated distinctly with weight gain; those from a poorer background with 10 known BMI-increasing alleles weighed an extra 3.8 kg on average, compared with only 2.9 kg extra in those with a higher socio-economic status.

This novel study indicates that there is a great deal more to the risk of obesity than initially believed. The authors explained: "It is



premature to suggest public health measures should be targeted specifically at fried food reduction, fizzy drink consumption, and diet in those genetically predisposed to obesity. Instead, public health measures aiming to alter all aspects of the obesogenic environment in small ways may have more impact in lowering the prevalence of obesity and Type 2 diabetes than targeting a single or few aspects.”

### High Depression Rates Found Among Type 2 Diabetes Patients

ANALYSIS of the INTERPRET-DD study has shown that 10% of Type 2 diabetes (T2D) patients suffer from depressive disorders, according to a EASD press release dated 14<sup>th</sup> September 2016.

This high rate was determined from 3,000 patients in the intercontinental study spanning 16 countries. Roughly 200 patients with 17 countries completed the Patient Health Questionnaire-9, Problem Areas in Diabetes scale, and the WHO-Five Well-being Index. The demographic information for each patient was also collected, with all undergoing a psychiatric review.

“Low levels of documentation of depression may lead to a lack of care for depression and poorer clinical outcomes.”

Overall, 45% of participants were male with a mean age of 54 years and a mean diabetes duration of 9 years. Major depressive disorder (MDD) diagnoses were made in 10.3% of all participants, with 10.3% also having had past MDD, and 5.1% with recurrent MDD. There was great variation in results between countries, with the lowest proportions of MDD diagnoses coming from Uganda (1.0%), India (2.0%), and Kenya (2.7%). The highest proportions were from Bangladesh (29.9%), Mexico (18.2%), and Russia (17.0%). In the USA, MDD rates vary between 11% and 35%, and between 5% and 18% in the UK, however these results were based on self-reported symptoms rather than clinical diagnoses.

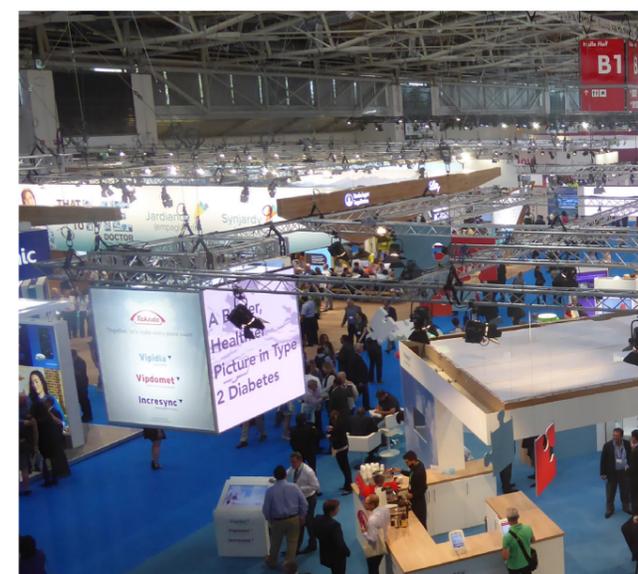
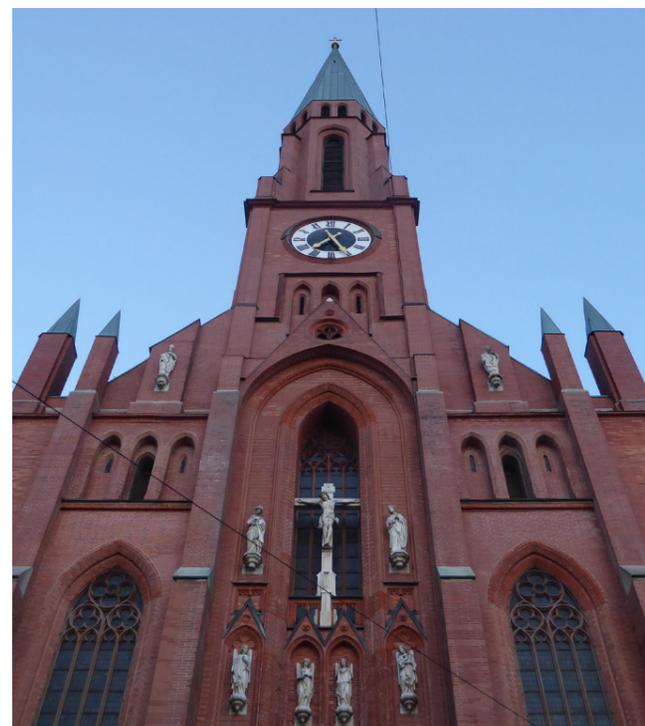
Further analysis of the results showed those diagnosed with MDD were more likely to be from an urban area (91.5%) than a rural

location (84.7%) and were more likely to be female (74% were female and 26% male). Patient age and duration of diabetes did not significantly vary between those with and without MDD.

Prior to this study, little was known about T2D patients and the relationship between mental disorders and clinical factors in countries aside from the USA and the UK. Prof Catherine Lloyd, Faculty of Health and Social Care, The Open University, Milton Keynes, UK, explained: “Our study [...] has found high rates of MDD and even higher rates of depressive symptoms with concomitant diabetes-related distress and overall poor well-being. Low levels of documentation of depression may lead to a lack of care for depression and poorer clinical outcomes.” Another analysis which reports further data is set to be published in due course.

### Living with Spouse Significantly Reduces Risk of Being Overweight in Diabetes Patients

TYPE 2 diabetes (T2D) patients who live with their spouse are half as likely to be overweight as T2D patients who live alone, according to a study presented at EASD by Dr Yoshinobu Kondo, Graduate School of Medicine, Yokohama City University, Yokohama, Japan and co-researchers.



“These findings suggest that social supportive care is needed to help single patients with T2D manage their body weight.”

Being overweight causes T2D patients to have increased insulin resistance which worsens blood sugar control, and the risk of cardiovascular disease is heightened with metabolic syndrome. Managing body weight in these patients is challenging, so discovering ways that this can be achieved is vital. Building on previous studies, the researchers sought to assess the effect that living with a spouse has on overweight status and metabolic syndrome in patients with T2D.

The marital status and metabolic syndrome-related information were assessed in a cross-section of T2D patients from June 2010–March 2016 using a medical chart review. A bioelectrical analyser examined the patients’ BMI and body fat mass, before statistical analyses were carried out to ascertain the association between marital and overweight status (BMI:  $\geq 25.0$  kg/m<sup>2</sup>) and metabolic syndrome. Metabolic syndrome was diagnosed according to the worldwide definition of the International Diabetes Federation (IDF).

In total, 270 consecutive T2D patients were assessed; 180 were married living with their spouses (109 males and 71 females), and 90 were single (46 males and 44 females). The results showed that the married patients had significantly lower BMI (mean: 24.5 versus 26.5), glycated haemoglobin levels (7.0% versus 7.3%), body fat mass (18.9 versus 23.5 kg),

and metabolic syndrome (54% versus 68%) compared to single patients.

Following adjustments for a number of factors including age, it was found that the married patients were 50% less likely to be overweight, with no statistically significant differences between the sexes.

“Our findings show that being married and living with one’s spouse reduced the risk of being overweight by approximately 50% among patients with T2D [...] In contrast, being single was a risk factor for overweight status and metabolic syndrome, especially among male patients. These findings suggest that social supportive care is needed to help single patients with T2D manage their body weight,” concluded the authors in a EASD press release dated 15<sup>th</sup> September 2016.

### Replacing Discretionary Foods with Core Foods Improves Diet Quality

REPLACING discretionary foods with core foods can improve your diet, according to a study presented in a EASD press release dated 13<sup>th</sup> September 2016. The lead author of the study was Dr Tom Wycherley, School of Health Sciences, University of South Australia, Adelaide, Australia. It has been observed that reducing the amount of food in the diet may result in nutrient deficits. It is also difficult to sustain, as people may experience hunger

and thus reduce compliance with this dieting strategy. Speaking about the study, the authors said: “Replacing some discretionary choices with less energy-dense core foods is likely to be a more sustainable option to improve diet quality and reduce daily calorie intake without resulting in increased hunger.”

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In high-income countries, the intake of unhealthy foods tends to be increased, displacing the consumption of core foods such as fruit, lean meats, and whole grains. In Australia, over one-third of energy intake is composed of discretionary foods. The study evaluated the potential impact of different methods for reducing the population level of nutrient deficiencies, obesity, and associated chronic diseases. The food and nutrient intake data from 12,153 respondents to the 2011–2013 Australian Health Survey was used. The data were population-weighted and then combined into food categories. Once this was carried out, data modelling was conducted to simulate the results of the different methods. Results were modelled for both the entire Australian population and a subset of people (4.7%) that self-reported having diabetes.



15-17,000 attendees



The results determined that in the overall Australian population, reducing the portion size of all discretionary foods would reduce the average daily energy intake per person by 9% (184 calories). If these discretionary foods were replaced by core foods, this would lead to a 3.6% reduction in energy intake, a 2.3% greater protein intake, a 10.8% reduction of added sugars, and a 3.9% reduction in sodium compared to the original diet. Lowering the amount of sugar in discretionary foods by 25% led to a total energy reduction of only 0.4%. In the future, the authors plan to implement head-to-head comparisons of these various methods of reduction.

### Modelling Associations Between Fatty Acids and Type 2 Diabetes

RISK FACTORS linked with a number of major non-communicable diseases has shown an association between fatty acid consumption and Type 2 diabetes (T2D). The data were presented in a EASD press release dated 13<sup>th</sup> September 2016.

Fatty acids form an important element of human nutritional requirements, however investigation of their impact on T2D risk has been minimal, with mixed results. The French E3N study thus explored the question using 14 years of follow-up data from 71,334 baseline non-diabetic females. Validated questionnaires were used to estimate dietary intake of fatty acid in 1993 and diabetes diagnoses throughout the follow-up period; the latter was also measured using drug reimbursement claims. All diagnoses were validated and an algorithm calculated the risk of T2D based on the data.

2,000 abstracts submitted

“ We would not necessarily recommend cutting these sources out of our diet, but perhaps diminishing meat intake, as it is often consumed in much greater quantities than our nutritional requirements. ”

Division of the cohort by BMI revealed a positive association of diabetes with total polyunsaturated fatty acid intake in the non-overweight group, with an increased risk of 22% in the highest consuming third (33%) of the group compared with the lowest; >15.3 g/day compared with <12.0 g/day. The computer model also analysed risk associations for a number of specific fatty acids within the omega-3 and 6 groups, with varying results.

The omega-3 group demonstrated a positive association with T2D risk across the entire cohort and when adjusted for confounding variables, with an increased risk of 26% in the top third compared with the bottom. Docosapentaenoic acid (DPA) in particular demonstrated an increased T2D risk of 54% and 45% in the overweight and non-overweight groups, respectively.



Arachidonic acid (AA) was the only omega-6 fatty acid to show a positive association; the computer model calculated an increased risk of 74% and 50% between the top third ( $\geq 0.25$  g/day) and the bottom third ( $< 0.19$  g/day) in the overweight and non-overweight groups, respectively. Both AA and DPA remained associated with T2D risk following adjustment for their primary source, the consumption of meat, at 42.7% and 31.3%, respectively. The authors advised: “We would not necessarily recommend cutting these sources out of our diet, but perhaps diminishing meat intake, as it is often consumed in much greater quantities than our nutritional requirements.”

### Study Shows Insulin Sensitivity is Improved by Vitamin D

VITAMIN D has been found to improve insulin sensitivity in mice that are insulin-resistant because of a high-fat high-sugar (HFHS) diet, according to a EASD press release dated 14<sup>th</sup> September 2016, following a study performed by Dr Elisa Benetti and colleagues, University of Turin, Turin, Italy.

Vitamin D decreases fat build-up in muscles and there is a strong correlation between vitamin D deficiency and Type 2 diabetes. It is also linked with myopathy which suggests a link between vitamin D and muscle function. Insufficient vitamin D increases the risk of insulin resistance, although the reasons for this are not yet fully understood.

The study analysed 40 male mice, given a standard diet or a HFHS diet over 4 months. Subgroups of the mice were given vitamin D 7 mcg/kg three times per week for the final 2 months of the study. The researchers measured body weight and food intake weekly, and at the end of the study performed a glucose tolerance test. Fat generation and insulin signalling were also analysed.

“ Some clinical studies in humans have been conducted to evaluate the effect of vitamin D supplementation on the incidence or progression of Type 2 diabetes, but the results are not conclusive at the moment. ”

# Munich

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## Anabolic Steroid Use Can Impair Insulin Sensitivity

MISUSE of anabolic androgenic steroids (AAS) has been linked with damage to insulin sensitivity (IS), as discussed in a EASD press release dated 13<sup>th</sup> September 2016. The study, conducted at Herlev University Hospital, Copenhagen, Denmark, analysed the effects of AAS abuse on abdominal fat distribution and IS in young men.

The cross-sectional case control study featured three groups, totalling 100 men aged  $\leq 50$  years: i) current AAS misusers (n=37; mean age: 31.4 years), ii) former AAS misusers (n=33; mean age: 34.8 years), and iii) age-matched healthy controls who had never misused AAS (n=30; mean age: 31.5 years). A 120-minute oral glucose tolerance test (OGTT) was carried out after  $\geq 8$ -hour overnight fasting. Plasma glucose and insulin levels were collected at 0, 30, 60, 90, and 120 minutes and the Matsuda index was used to calculate IS in each participant. The team analysed the distribution of abdominal fat, both as visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT), using a DEXA-scan.

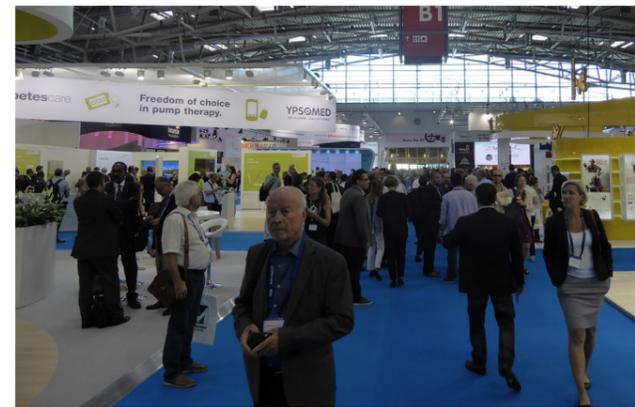
“The current data suggest that a history of AAS misuse leads to impaired IS, even several years after AAS cessation, compared with healthy controls who had never used AAS. This effect could be mediated by increased VAT as the primary metabolically active fat tissue.”

Matsuda index scores were lower for patients with current and former AAS misuse, compared with the healthy control group (mean Matsuda scores 6.49, 5.09, and 8.51, respectively), suggesting greater impairment of IS. However, the patients in the current AAS abuse subgroup had the greatest lean body mass and lowest total body fat percentage of all groups (mean lean body mass values 25.4 kg/m<sup>2</sup>, 21.3 kg/m<sup>2</sup>, and 21.9 kg/m<sup>2</sup>; mean body fat values 14.1%, 17.3%, and 19.4%; for current abuse, former abuse, and controls, respectively).

Compared with the standard diet, the HFHS diet caused body weight increase in the mice (24.8 g versus 31.8 g, respectively), hyperglycaemia (108 versus 145 mg/dL, respectively), and impaired glucose tolerance. Fat build-up was far more prominent in the HFHS mice, as well as a notable increase of triglycerides. These factors were associated with impaired insulin responsiveness. However, amongst the mice who were administered vitamin D, body weight was reduced, myosteatosis was reversed, muscle insulin responsiveness was improved, and the oral glucose tolerance test produced more positive results.

For the HFHS mice, the expression of N<sup>ε</sup>-(Carboxymethyl)lysine, a main advanced glycation end product (AGE), was increased as well as expression of its receptor RAGE. AGES comprise proteins and lipids that are glycosylated after being exposed to sugars and lipids, and have been linked to the pathogenesis of many diseases, such as diabetes. These effects were considerably reduced by vitamin D.

The authors commented: “Some clinical studies in humans have been conducted to evaluate the effect of vitamin D supplementation on the incidence or progression of Type 2 diabetes, but the results are not conclusive at the moment.”



Although VAT volume was higher in the AAS subgroups compared to the controls (mean values 388 cm<sup>3</sup>, 347 cm<sup>3</sup>, and 290 cm<sup>3</sup> for current abuse, former abuse, and no abuse, respectively), SAT volumes were unpredictably different in each group: 546 cm<sup>3</sup> in current AAS misusers, 962 cm<sup>3</sup> in former misusers, and 748 cm<sup>3</sup> in the healthy control group.

The researchers commented: “The current data suggest that a history of AAS misuse leads to impaired IS, even several years after AAS cessation, compared with healthy controls who had never used AAS. This effect could be mediated by increased VAT as the primary metabolically active fat tissue.”

## UK Pilots with Insulin-Treated Diabetes Pose No Extra Risk to Passenger Safety

PILOTS with insulin-treated diabetes have been granted medical certification and permitted to obtain commercial pilot's licences within the UK since 2012. A follow-up analysis, presented at this year's EASD meeting, has shown no increased risk to passenger safety, so long as protocols are followed strictly and blood sugar ranges are maintained.

In a EASD press release dated 12<sup>th</sup> September 2016, results evaluating the success of the agreed Medical Assessment Protocol under the European Aviation Safety Agency UK regulation programme, established by aviation and clinical professionals, showed no significant safety concerns and no compromise in the pilots' own diabetes management. During the study, a total of 8,897 recordings were made by 26 diabetic pilots, across 4,900 hours of flight. On average, participants

were diagnosed with the disease 8 years prior to certification and were approximately 41 years of age. All participants were male.

“Regular blood glucose testing in the cockpit ensures that any variability in blood sugar is detected and can be corrected early.”

Comparing blood glucose values (HbA1c) taken before and after the issue of a Class I Medical Certificate, found that there was no significant alteration between the two and therefore disease management was not affected drastically by long shifts, disruption of eating times, or jet lag. At present, there have been no reported diabetes-related incidents during any UK commercial aircraft flight, where pilots have become debilitated and required replacement. Correlating blood glucose levels using the standard UK Civil Aviation Authority (CAA)-specified monitoring ranges, it was found that only 0.2% of values recorded were within the 'red' range (<4 or >20 mmol/L).

Dr Julia Hine, Cedar Centre, Royal Surrey County Hospital, Surrey, UK, stated: “Regular blood glucose testing in the cockpit ensures that any variability in blood sugar is detected and can be corrected early.” Medical staff behind this study wish to repeat their investigation with the addition of newly certified UK commercial pilots because clinical diagnosis of Type 2 diabetes within the USA and the majority of Europe currently disallows Commercial Pilot Licence accreditation. It is hoped that further data analysis may soon change this.



## Preconception and Gestational Diabetes Both Linked to Neonatal Birth Defects

DIABETES in women is a condition requiring careful management throughout pregnancies to minimise risks to both newborn and mother. Published in a EASD press release dated 12<sup>th</sup> September 2016, research has now shown a definitive link between poor neonatal outcomes in women already diagnosed with the disease before conception as well as in those who develop it during their pregnancy.

Led by Dr Basilio Pintuadi, Niguarda Ca' Granda Hospital, Milan, Italy, the risks of gestational diabetes mellitus (GDM) and pregestational diabetes mellitus (PGDM), particularly affecting the child, were compared with complications seen in healthy pregnancies. Distinguishable from many studies already published, the team also factored in the effects of additional concomitant clinical conditions including hypertension and thyroid disorders.

“ Greater attention should be placed on the care of pregnant women with gestational diabetes or diabetes. ”

Within this study, 135,163 documented cases of single pregnancies, some complicated by either GDM (n=1,357) or PGDM (n=243), were selected from healthcare data spanning 2002 and 2012 within the Italian region of Puglia, which covers >2 million women recorded by 12 different local health authorities. Data collected were analysed using computer modelling to estimate the associated risks posed by GDM or PGDM, with results adjusted accordingly for mothers diagnosed with further neonatal risk-associated factors: age, hypertension, and thyroid conditions. Out of 1,357 childbirths complicated by GDM and 243 by PGDM, the risk of numerous poor outcomes was increased when compared with those understood in normal pregnancies; hypoglycaemia (odds ratio [OR] of 10 for GDM, 36 for PGDM), small gestational size (GDM 1.7, PGDM 5.8), large gestational size (GDM 1.7, PGDM 7.9), jaundice (GDM 1.7, PGDM 2.6), fetal deformity (GDM 2.2, PGDM 3.5), hypocalcaemia and hypomagnesaemia (GDM 1.8, PGDM 9.2),

and delivery by caesarean (GDM 1.9, PGDM 8.5). An increased risk of neonatal respiratory distress and polyhydramnios (excess amniotic fluid) was only seen with PGDM and not GDM (OR: 2.7 and 46.5, respectively).

Dr Pintuadi explained: “Both gestational diabetes and diabetes in the mother when she becomes pregnant are associated with adverse outcomes in the baby independently of the presence of other clinical conditions complicating the pregnancy. Greater attention should be placed on the care of pregnant women with gestational diabetes or diabetes.”

## Summertime Sadness for Pregnant Women Suffering Gestational Diabetes

SEASONAL weather could greatly affect pregnant women who are suffering from gestational diabetes mellitus (GDM), a study has found which was discussed in a EASD press release dated 13<sup>th</sup> September 2016. The research, conducted by Dr Anastasia Katsarou, Diabetes and Celiac Unit, Lund University and Skåne University Hospital, Malmö, Sweden, and her team, found that the rates of GDM peaked during summer months, suggesting a link between temperature and diabetes.

The Mamma Study, which took place in southern Sweden, recruited 11,538 women who all agreed to undergo the universally applied standard 75 g oral glucose tolerance test at Week 28 of pregnancy. The results were gathered over the 3-year study period and were grouped together into months and seasons. GDM was calculated using statistical modelling to see the differences between seasons and used to examine whether a particular season was associated with the diagnosis of GDM. Temperature recordings during these periods were obtained from the Swedish Meteorological and Hydrological Institute.

Running for 52 years 

“ Our findings suggest seasonal variations in the 2-hour glucose concentration and in the proportion of women diagnosed with GDM with a peak in the summer. ”

A total of 487 women developed GDM during the study period. The frequency of GDM varied significantly between the months, increasing from 2.9% to 5.8% from March to June. With regard to seasons, the frequency increased from 3.3% to 5.5% between spring and summer. Mean temperatures ranged from -0.6°C-17.7°C from winter to summer, with further analyses indicating an increase in 2-hour glucose level by 0.009 mmol/L for every degree increase in temperature.

Overall the data showed an increase in glucose levels during the summer months (June-August) and a 51% (1.5-times higher) increase in GDM in comparison with other months. However, when the mean monthly temperatures were adjusted, this link between season and GDM was no longer apparent. Seasonality and diabetes has been well-researched in the past, however less is known about the effects on Type 2 diabetes. This research has suggested that temperature could be a part of the reason for GDM development during pregnancy and that further research is needed to explore the significance. Nonetheless, the authors concluded: “Our findings suggest seasonal variations in the 2-hour glucose concentration and in the proportion of women diagnosed with GDM with a peak in the summer. A positive association with the ambient temperature was demonstrated.”



## One-Hour Daytime Naps Could Be a Sign of Diabetes

NAPPING for 1 hour or more in the daytime has been associated with a 45% increased risk of developing Type 2 diabetes, according to a EASD press release dated 14<sup>th</sup> September 2016, following a study carried out by Dr Yamada Tomahide, University of Tokyo, Tokyo, Japan, and colleagues.

Recent research has found that a U-shaped curve represents the correlation between duration of sleep per night and incidence of metabolic disease. Many people nap for short periods of only a few minutes to longer periods of a few hours, and whilst some nap occasionally, others nap habitually several times per day. Some individuals take naps because they feel excessively tired during the daytime due to sleep disorders.

The authors of the study performed a meta-analysis to examine the relationship between the risk of metabolic diseases and napping. Electronic databases were used to find eligible study reports and the Newcastle-Ottawa Scale was used to assess validity. The meta-analysis included 307,237 Asian and Western individuals within 21 reports. It was found that taking longer naps of ≥60 minutes per day positively correlated with an increased risk of developing Type 2 diabetes by 45%, compared to no napping during the day. Taking a nap for <60 minutes per day did not increase the risk. Another meta-analysis

showed a J-shaped relationship between the length of napping and the risk of developing metabolic syndrome. The results showed that there was no increase in risk for napping <40 minutes per day, whilst there was a notable increase in risk for those napping for ≥60 minutes per day. However, no correlation was found between nap time and the risk of obesity.

“ A short nap might have the effect of improving an abnormal circadian rhythm and modifying a variety of endocrine abnormalities caused by sleep deprivation. ”

Sleep deprivation has been associated with a decrease of leptin, an increase of ghrelin, and an increased appetite. Depression is also linked with an increased risk of diabetes. In light of this, the authors noted possible benefits of taking short naps in the daytime: “A short nap might have the effect of improving an abnormal circadian rhythm and modifying a variety of endocrine abnormalities caused by sleep deprivation.”

### Predictor for Risk of Death in Type 2 Diabetes

HIGH levels of a growth factor protein called angiopoietin-like protein 2 (ANGPLT2), a pro-inflammatory circulating protein that plays a key role in the formation of blood vessels, insulin-resistance, and atherosclerosis, are associated with an increased risk of death and serious cardiovascular events in patients with Type 2 diabetes mellitus (T2DM), according to a EASD press release dated 12<sup>th</sup> September 2016. The study's lead authors were Dr Barnabas Gellen and Dr Mathilde Fraty, Polyclinique de Poitiers, Poitiers, France.



This study involved a follow-up of 1,353 consecutively recruited T2DM patients for a median of 6 years. Patients were recruited from the SURDIAGENE study, a French study examining the environmental and genetic determinants of both microvascular and macrovascular complications in T2DM. All-cause death was used as the primary endpoint, with the secondary endpoint being the combined outcome of cardiovascular death, stroke, and myocardial infarction. Baseline ANGPLT2 levels were recorded for each patient. Mean patient age was 64 years and 58% were male. During the follow-ups, 367 of patients died and 290 presented with a major adverse cardiac event (MACE).

As part of the analysis, patients were divided into quartiles based on their baseline serum ANGPLT2 concentration. It was found that, after adjustment for age, sex, and established cardiovascular risk factors, patients in the highest quartile (with an ANGPLT2 concentration of ≥19.5 ng/mL) had on average a 2.5-times greater risk of death and MACE compared with those patients in the lowest three quartiles.



Commenting on their study, the authors stated: “In patients with Type 2 diabetes, serum ANGPLT2 concentrations were independently associated with death and MACE. Therefore, ANGPLT2 is a promising candidate biomarker for improving risk stratification in Type 2 diabetes patients, and may prove to be a valuable therapeutic target.” Concentrations of ANGPLT2 are not routinely tested for in patients, therefore the authors believe that adopting this practice could be useful. However, they add that before any changes to clinical practice are made, their results must be confirmed by findings from other trials.

“ ANGPLT2 is a promising candidate biomarker for improving risk stratification in Type 2 diabetes patients, and may prove to be a valuable therapeutic target. ”

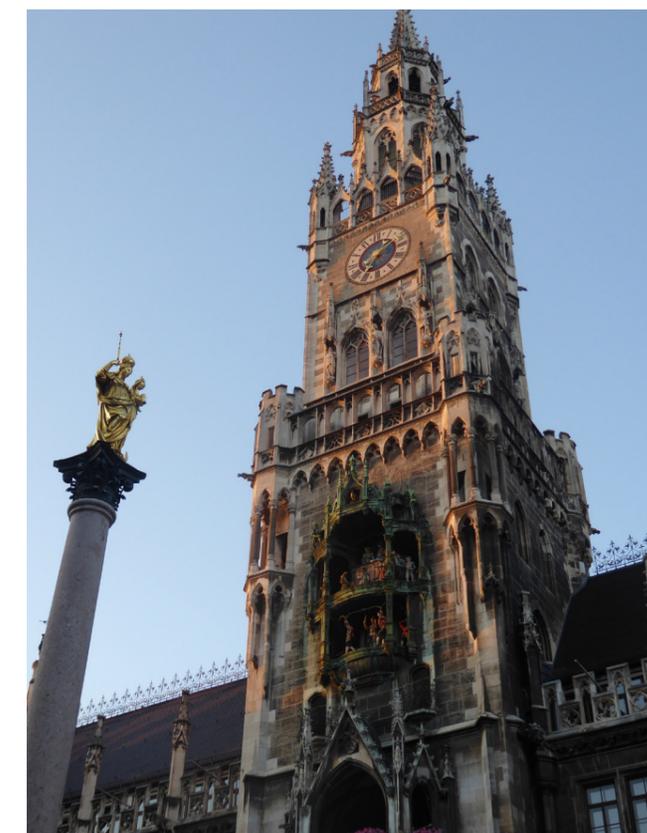
### Better Glucose Control Reduces Risk of Heart Attack, Stroke, and Blindness

IMPROVED blood sugar control in Type 2 diabetes mellitus (T2DM) patients decreases their chances of macrovascular events, including heart attack and stroke,

and microvascular events, such as blindness and amputation, according to a EASD press release dated 15<sup>th</sup> September 2016.

Meta-analyses and randomised controlled trials of glucose-lowering in T2DM showed notable reductions in macro and microvascular events. The research team estimated 10-year risks for such complications when targeting various HbA1c levels which measure blood sugar control between 6% and 10% to measure any benefits.

The study, led by Dr Samiul A. Mostafa, Diabetes Trials Unit, University of Oxford, Oxford, UK, and colleagues, used the UK Prospective Diabetes Study (UKPDS) Outcomes Model version 2.0 to imitate the burden of T2DM over a lifetime, utilising 89,760 patient-years of data. The data were used to work out 10-year event rates for heart attack, stroke, blindness, and amputation in a group of 15,000 T2DM and cardiovascular disease patients from 38 countries in the TECOS study. Mean patient values were ascertained for age (66 years), T2DM duration (11 years), systolic blood pressure (134 mmHg), and bad (2.3 mmol/L) and good (1.1 mmol/L) cholesterol. Of the group, 28% were female and 11% were smokers.



“ These simulated outcomes provide patients and clinicians a guide to the potential glucose-lowering benefit possible when targeting progressively lower HbA1c values from a baseline of 10%. Running the UKPDS Outcomes Model for individual patients could give personalised risk reduction estimates to help better inform diabetes management. ”



For 5,766 of these patients, baseline risk factor values including age, sex, systolic blood pressure, weight, heart rate, haemoglobin, and history of macro and microvascular events were readily available. Whilst patients' risk factors remained at their baseline values, complication rates were estimated alongside HbA1c levels, remained constant at 10%, 9%, 8%, 7%, and 6%. For each HbA1c reduction from 10–6%, the risk of complications significantly decreased, whilst relative risk reductions increased for each 1% of HbA1c decrease.

The research team believes the study offers a positive option in improving diabetes management: “These simulated outcomes provide patients and clinicians a guide to the potential glucose-lowering benefit possible when targeting progressively lower HbA1c values from a baseline of 10%. Running the UKPDS Outcomes Model for individual patients could give personalised risk reduction estimates to help better inform diabetes management.”



**Newly Diagnosed Type 2 Diabetes Link with Pancreatic Cancer**

SCREENING patients with newly developed Type 2 diabetes mellitus (T2DM) is a potentially effective way of detecting pancreatic cancer (PAC) early, according to a EASD press release dated 14<sup>th</sup> September 2016.

New-onset T2DM or prediabetes with a duration of <2 years, particularly if significant weight loss is observed, is an early symptom of PAC. The researchers found more patients with PAC associated with new-onset diabetes than long-term diabetes.

The study aimed to determine the sensitivity and specificity of the biochemical marker cancer antigen (CA) 19-9 alone, and with the promising markers microRNA-196 and 200, in distinguishing PAC patients from non-cancer patients. Sixty T2DM patients with PAC (35 males, 25 females, mean age: 67 years) were chosen in the study, along with 34 T2DM patients without PAC (27 males, 7 females, mean age: 63 years) and a healthy control group of 30 people (22 males, 8 females, mean age: 63 years). Needle biopsy or surgical resection of the tumour confirmed the cancer diagnosis and T2DM or prediabetes diagnoses were made according to American Diabetes Association (ADA) criteria.

Forty-four PAC patients had new-onset diabetes and 16 PAC patients had long-term T2DM. When CA 19-9 was used alone to detect cancer it had a sensitivity of 85% and a specificity of 73%, but a combination with microRNA-196 and 200 improved the sensitivity to 95% and specificity to 77%.

The authors of the study, led by Dr Pavel Škrha, Second Department of Internal Medicine, Charles University, Prague, Czech Republic, believe this process can improve prospects for patients, stating: “Thanks to high sensitivity, a combination of modern molecular markers microRNA-196 and 200 together with CA 19-9 could be used in the first line of non-invasive pancreatic cancer screening in patients with new-onset diabetes. It would reduce the delay in the diagnosis of pancreatic cancer and improve the prognosis of diabetic patients with this malignant disease.”

The outcomes associated with PAC are some of the worst for any cancer, so higher detection of new-onset diabetes or prediabetes could be important in gaining an early diagnosis. The authors added that if weight loss and gastrointestinal symptoms are present, further investigation may be initiated.



“ ...a combination of modern molecular markers microRNA-196 and 200 together with CA 19-9 could be used in the first line of non-invasive pancreatic cancer screening in patients with new-onset diabetes. It would reduce the delay in the diagnosis of pancreatic cancer and improve the prognosis of diabetic patients with this malignant disease. ”

