MANAGING THE THREAT OF HYPOGLYCAEMIA
Diabetes views

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International Diabetes Federation
Promoting diabetes care, prevention and a cure worldwide

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Diabetes Voice is available online at www.diabetesvoice.org

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Diabetes Voice Online - September 2015

Transparency, education and acceptance

Elizabeth Snouffer

The feature article for this issue of Diabetes Voice is focused on bringing to light the global concern of hypoglycaemia for all people living with diabetes, including for people with type 2 diabetes who are treated with orals or insulin. It is a topic that deserves great attention, not only because the threat is often misunderstood or downplayed by healthcare professionals, people living with diabetes and people who live with or share the burden of diabetes, but because it ultimately and most critically, can lead to early, preventable death.

In the feature, we learn that published data from recent clinical trials asserts that rates of severe hypoglycaemia in both types of diabetes, but especially with type 1 diabetes, have fallen in the past 20 years, since tight control was proven to be one of the important treatment pathways to avoid diabetes complications. The authors argue that this data could be falsely positive and may underestimate the risk of hypoglycaemia in the wider global population tasked with self-managing insulin therapy on a 24/7 basis. In other words, vigilance against hypoglycaemia is critical for anyone living on exogenous insulin for life. This is also true with certain oral medications such as sulphonylureas.

As a child diagnosed with type 1 diabetes nearly 40 years ago, I believed then and still do today that although exogenous insulin, the discovery of which was celebrated in 1921, has allowed millions of people like me to survive, it is a cruel twist of fate that this life-saving drug is also responsible for great suffering and even fatality due to the interplay of too much insulin and compromised glucose counter-regulation. The burden has always been great, but especially in the last 15 years with the broad acceptance of tight control to attempt to avoid complications such as blindness, nerve damage, kidney failure and yes, early death.

In 2012, after 38 years of living with type 1 diabetes and an Hba1c just below 7%, I had my first severe episode: it was a nocturnal hypoglycaemic event which ironically occurred during the American Diabetes Association’s Annual Meeting. My husband called the paramedics from the hotel room, watched helplessly as I seized multiple times, sadly forcing my teeth into my bottom lip. Two hours later I awoke surrounded by paramedics with my face covered in blood and a glucose IV in my wrist. I was taken to the emergency room for observation and later the next day met up with my doctor - also in attendance at the meeting - adamant that I have MRI screenings to see if any damage had occurred to my brain. It is important to note that I wore both an insulin pump and a Continuous Glucose Monitor (CGM) which had failed to alert.

I survived without any physical damage but the emotional repercussions of the event were weighty. After 72 hours, I began to feel cognitively brighter but it took months for me to feel confident about my ability to trust my own self-management skill and treatment, although the cause of the hypo was never ascertained. It also took weeks for my husband to admit that he thought he had “lost me” for good. We worked together on managing our equal but different anxieties. Today my faith has been restored in sub-cutaneous insulin infusion and the CGM which like any piece of technology is never going to be failsafe. Regulatory oversight has never been as important as it is now for diabetes self-management devices, especially related to insulin therapy.

What can we learn from population data? Recent research suggests that the self-reported frequency of severe hypoglycaemia for an American adult living with type 1 diabetes is as high as three per year, and mild hypoglycaemia
is said to occur at least as often as twice a week.

These numbers are too high to minimize the threat of hypoglycaemia, even considering that they are grossly under-estimated. The symptoms of mild hypoglycaemia are nothing to sneeze about and include sweating, fatigue, inability to communicate, dizziness, loss of vision and more. What’s so amazing to me about people with diabetes and “mild” hypoglycaemia is how we are all so competent to manage the condition, coaching ourselves that we can pull through and pouring sugar down our throats in hopes of avoiding an emergency situation or worse.

Mild episodes can take more than 60 minutes to “feel right,” and if social media is anything to go by, mild hypos occur at an alarming rate for people trying to achieve tight control. I experience and I read about daily hypoglycaemic episodes from fellow type 1 contacts, their friends and at least once a day someone I know, virtually or personally, living with diabetes will communicate the “awful low”, how long it took to recuperate and how the counter-regulatory response accommodated “a rebound of 400 mg/dL.” More terrible are the reports I hear from the online diabetes community about the death of a loved one from a nocturnal hypoglycaemic episode often coming to my attention at a monthly rate. The shame surrounding the loss for families is so great that these deaths are tragically underreported.

Stigma and hypoglycaemia go hand-in-hand although this is also a characteristic intertwined with the pressure for absolute perfection, which is both unrealistic and leads to many people either hiding problems or “giving up” on their diabetes. The call for people with diabetes to self-manage without failure and achieve near Herculean results is cruelly unparalleled compared to other therapeutic categories in disease management.

“You cannot fail and you can do better,” appears to be the call to action and who can argue? “Better” protects all parties connected to diabetes. Yet those of us on insulin keen to live long lives survive doubly and daily with the threat of hypoglycaemia. We carry on and nod our heads at all the foreboding threats, driven to test, dose and measure again. “Will I ever measure up?” I heard one person with diabetes say. It is hard work. Those with the greatest support succeed. “Better” is aspirational but it will never eliminate hypoglycaemia.

Recently a story circulated in the diabetes community that discussed a parent punishing their child with type 1 diabetes for behaviours exhibited during hypoglycaemic episodes even though information that low glucose concentrations induce symptoms such as altered mental states are widely available. It could be said that never before has education and engagement of healthcare practitioners, people living with diabetes, parents, and other caregivers in the management of diabetes to minimize hypoglycaemia been such a top priority.

Hypoglycaemia will be a part of insulin therapy until we find better treatments or ultimately, the cure. Transparency, education, acceptance, compassion and teamwork will help those of us living now make it until that day comes.

About the Author

Elizabeth Snouffer is Editor of Diabetes Voice.
IDF Recognised Education Programme launches new call for applications

The International Diabetes Federation has launched a new call for applications for its Recognised Education Programme. The programme recognises courses offered by organisations for health professionals in diabetes education and management that are consistent with the IDF International Curriculum for Health Professionals in Diabetes. A seal of recognition sends a message to the public that a programme has undergone an external review and achieved a level of excellence in the education of healthcare providers working in the field of diabetes education and management. To date, IDF has recognised 23 programmes conducted by 13 organisations in Argentina, Bangladesh, Canada, Guatemala, India, Iran, New Zealand, Philippines and the UK.

For more details and to download the application form, visit www.idf.org/recognition-programme. The deadline for applications is 1 October 2015.

IDF workshop in India to highlight findings from WINGS project

The International Diabetes Federation will hold a workshop in Chennai, India on 26-27 September 2015 to share learnings from the IDF Women in India with GDM Strategy (WINGS) project. The WINGS project is a new strategy to tackle the rising prevalence of gestational diabetes mellitus (GDM) in India and other lower- and middle-income countries. Developed through a partnership between the IDF, the Madras Diabetes Research Foundation (MDRF) in Chennai, India and the Abbott Fund, the philanthropic foundation of the global health company Abbott, the project has developed a model approach to care for low-resource settings that will confront the widespread challenges in GDM screening and management.

The project has developed an educational approach to GDM care, seeking to improve the health outcomes of women with GDM and their new-borns. The resulting GDM Model of Care was piloted in Chennai, and subsequently adapted to be scaled up in other countries worldwide.

The objective of the workshop is to share with national authorities and healthcare providers in India the findings of the project as well as the educational toolkit and other resources that have been developed. It will also offer the opportunity for healthcare professionals to identify strategies to leverage the resources developed at both local and national levels to reach more pregnant women.

The outcome of the discussions will feed into the publication of a call for action on gestational diabetes in India and around the world.

For more information, visit www.idf.org/women-india-gdm-strategy-wings.
Study finds sugary drinks linked to increased risk for type 2 diabetes

Sugary drinks are linked to an increasing rate of type 2 diabetes both in the UK and in the USA, a study conducted by a team of researchers from Cambridge University reported. Interestingly, even those who are physically fit but drink sugary beverages are also at risk of diabetes. The researchers also pointed out that even so-called “diet” drinks or fruit juices that contain artificial sweeteners are not good for the healthy.

The study, published in the BMJ, reviewed 17 separate observational studies. However, the authors failed to identify how many sweetened drinks actually trigger type 2 diabetes but there are credible biological factors that link sugar intake to a rapid rise in blood glucose. The authors inferred that present level of consumption of sugary beverages was enough to cause “approximately 2 million excess events of type 2 diabetes in the USA and 80,000 in U.K. over 10 years.” Translated into monetary terms, this costs Americans roughly GBP 12 billion and Britons GBP 206 million.

Habitual consumption of sugar sweetened beverages was associated with the greater incidence of type 2 diabetes independently of adiposity. Although artificially sweetened beverages and fruit juice also showed positive associations with incidence of type 2 diabetes, the findings were likely to be influenced by methodological bias. None the less, both artificially sweetened beverages and fruit juice were unlikely to be healthy alternatives to sugar sweetened beverages for the prevention of type 2 diabetes. Under assumption of causality, consumption of sugar sweetened beverages over years may be related to a substantial number of cases of new onset diabetes.

Coke’s new scientific platform faces scrutiny

Coca-Cola, the world’s largest producer of sugary beverages, is backing a “science-based” solution to the obesity crisis asserting that in order to maintain a healthy weight, people need to exercise more and worry less about cutting calories.

In an effort to get the word out in medical journals, at conferences and through social media, Coke is providing financial and logistical support to a new nonprofit organization called the Global Energy Balance Network (GEBN), which is registered to Coca-Cola’s headquarters in Atlanta, Georgia, USA. GEBN.org asserts that Americans are too worried about diet and ignore exercise which may be the real cause behind the obesity epidemic.

Experts have called GEBN’s message misleading, citing Coke’s backing as an effort to minimize the role sugary drinks have played in the spread of obesity and type 2 diabetes.

The public health clash over the science of obesity comes in a period of rising efforts to tax sugary drinks, eliminate sugary drink sales in schools and stop marketing efforts to children. According to recent data reports, consumption of full-calorie sodas by the average American has dropped by 25% over the last 20 years. Coke’s sales are dropping and their scientific research platform is strategically placed in the face of lost profits.

Public outcry has forced Coca-Cola to now provide disclosure on all investments in scientific research and advocacy about the impact of sugary soft drinks on world health.
**Diabetes “will bankrupt the (UK) NHS”**

The UK popular daily press was strident on Monday, August 17th with the message that the cost of diabetes care is predicted to bankrupt the UK health service if there is no curb on the rise of diabetes (mainly type 2 diabetes) incidence and no curb on the consequences of diabetes complications (both from type 1 and type 2 diabetes).

The articles were prompted by the release of a report from the UK Health and Social Care Information Centre (www.hscic.gov.uk/catalogue/PUB18032) which analysed prescribing trends in primary care for diabetes (in England) from April 2005 to March 2015. During this period, there was a doubling of the number of anti-diabetic prescriptions and a net “ingredient cost” increase of just under 150%. Diabetes UK commented that “over the past decade, the number of people living with diabetes has increased by over one million people, which is the equivalent of the population of a small country such as Cyprus”. The press reports also highlighted the overall cost to the NHS (GBP 10 billion per year) and the fact that 80% of this is spent on the management of avoidable complications. NHS England admitted that the rising number of people with diabetes was a “stark warning.”

The overall message from Diabetes UK, however, was the positive underlining of the fact that “there is huge potential to save money and reduce pressure on NHS hospitals and services through providing better care to prevent people with diabetes from developing devastating and costly complications.”

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**Gestational Diabetes Mellitus (GDM) can be prevented with lifestyle intervention**

The Finnish Gestational Diabetes Prevention Study (RADIEL), a randomized controlled trial, found that a moderate individualized lifestyle intervention can reduce the incidence of GDM by 39% in high-risk pregnant women.

Two hundred and ninety-three women with a history of GDM and/or a pre-pregnancy BMI of ≥30 kg/m² were enrolled in the study at <20 weeks of gestation and were randomly allocated to the intervention group (n = 155) or the control group (n = 138). Each subject in the intervention group received individualized counselling on diet, physical activity, and weight control from trained study nurses, and had one group meeting with dietician. The control group received standard antenatal care. The diagnosis of GDM was based upon a 75-g, 2-h oral glucose tolerance test at 24–28 weeks of gestation. Results showed that the incidence of GDM was 13.9% in the intervention group and 21.6% in the control group, after adjustment for age, pre-pregnancy BMI, previous GDM status and the number of weeks of gestation.

Gestational weight gain was lower in the intervention group. Women in the intervention group increased their leisure time physical activity more and improved their dietary quality, compared with the women in the control group. These findings may have major health consequences for both the mother and the child.

[http://care.diabetesjournals.org/content/early/2015/07/08/dc15-0511.abstract](http://care.diabetesjournals.org/content/early/2015/07/08/dc15-0511.abstract)
Insulin resistance might increase Alzheimer’s risk

Results from a study published in JAMA Neurology showed that insulin resistance, a prevalent and increasingly common condition in developed countries, is associated with significantly lower regional cerebral glucose metabolism, which in turn may predict worse memory performance. People living with diagnosed diabetes may benefit from initiating treatments to lower peripheral insulin resistance to maintain neural metabolism and cognitive function.

“By altering insulin resistance in midlife, it may be possible to reduce future risk of Alzheimer’s,” said study co-author Barbara Bendlin, an Alzheimer’s researcher at the University of Wisconsin School of Medicine and Public Health, in an email to Reuters Health.

Insulin resistance, the body’s failure to respond to the hormone insulin, characterizes type 2 diabetes. Diabetes has been linked to Alzheimer’s disease, but the exact nature of the connection hasn’t been as clear.

Rising diabetes rates and declining heart health for ethnic Canadians

Steadily rising rates of obesity, type 2 diabetes and high blood pressure over the last decade have dramatically increased the risk of heart attacks and strokes among some groups of ethnic Canadians, researchers say.

An Ontario study conducted by researchers from the Institute for Clinical Evaluative Sciences (ICES) in Toronto determined that, from 2001 to 2012, type 2 diabetes rates more than doubled among South Asian men and almost doubled among black women. Steadily rising rates of obesity, type 2 diabetes and high blood pressure over the last decade have dramatically increased the risk of heart attacks and strokes among some groups of ethnic Canadians, researchers say. While obesity levels rose among all ethnic groups and sexes, the biggest increase was observed in Chinese men, whose rate more than doubled during the study period.

The study, published in the journal BMJ Open, analysed data from almost 220,000 Ontario residents who responded to Statistics Canada’s Canadian Community Health Surveys from 2001 to 2012.

It is believed to be the first in Canada to examine ethnic-specific cardiovascular risk-factor trends over time.

The analysis showed that black women and men and South Asian men had the greatest increases in risk factors for declining cardiovascular health over the period. Poor diet was a strong indicator behind the elevation in the risk for heart attack and stroke.

Black women were more likely to be obese and both groups less likely to consume fruits and vegetables regularly. Findings indicated that 20% of black females were obese in 2012, compared to 16% of black males. Even so, obesity rates were most pronounced among Chinese men, the ICES scientists discovered, indicating their risks of type 2 diabetes and cardiovascular disease are elevated compared to Caucasians.
Tragedy for migrant Syrian child with type 1 diabetes

A child with type 1 diabetes fleeing Syria with her family has died on a migrant boat after traffickers threw her insulin into the sea.

Rescued in Sicily in late July, the Syrian family told the non-profit Save the Children that they were travelling from Egypt with their six children, including their 11-year-old daughter who lived with type 1 diabetes. Parents told traffickers that the bag they were carrying contained essential insulin for their daughter, but the traffickers threw the bags overboard to make room for other passengers. The child died without the medicine.

Gemma Parkin, from Save the Children, said: “She was 11 and had type 1 diabetes. After one day, the daughter died in her mother’s arms and afterward her body was also thrown in the sea.”

Three men from the boat, believed to be the journey organisers, have been arrested. They are currently being held on suspicion of aiding illegal immigration, though no homicide charges have been brought. Italy’s Prime Minister Matteo Renzi paid tribute to the girl, saying “We can discuss everything, but let’s still be human when facing the pain of someone who had the right to dignity.”

Project will help most vulnerable, including people with diabetes

The UK Royal College of General Practitioners (RCGP) and Médecins Sans Frontières (MSF) have launched a three-year family medicine project to help the most vulnerable patients in Africa and the Middle East.

The 3-year project will place RCGP members into projects and Swaziland and Jordan to bring their skills to help some of the most vulnerable patients in the world. GP volunteers posted to Swaziland will work to provide access to free healthcare particularly for patients with TB, HIV and noncommunicable diseases such as diabetes as well as treating survivors of sexual violence.

In Jordan, GPs will focus on treating patients with diabetes, cardiovascular disease, asthma and COPD, identified as the greatest disease burden among the high numbers of Syrian refugees.

The RCGP will support recruitment of GP volunteers who will spend six to 24 months in one of the placements. As well as clinical duties, volunteers will use leadership and training skills and focus on delivering holistic care.

Médecins Sans Frontières (MSF) is an international, independent, medical humanitarian organisation that delivers emergency aid to people affected by armed conflict, epidemics, natural disasters and exclusion from healthcare. MSF offers assistance to people based on need, irrespective of race, religion, gender or political affiliation. The Royal College of General Practitioners is the professional membership body for family doctors in the UK and overseas.
President-Elect Shaukat Sadikot has seen the diabetes crisis play out in the world as a renowned global expert in endocrinology, but it is clear as he readies himself to take the helm as the next IDF President, he has one goal. “There is no question making a difference on the ground for diabetes is a challenge, and we need to change that. In that regard, I don’t want to lead the diabetes community so much as serve the needs of all diagnosed and undiagnosed people with diabetes.”

“With some 400 million people worldwide living with diabetes, the epidemic not only threatens individual health but presents itself as one of the greatest barriers to sustainable development and economic growth,” says the President-Elect. Currently, 11% of all global health expenditure is directed to addressing diabetes and its complications.

Key IDF strategic goals over the next two years will be focused on prevention, improving care, and driving integrated policy-making at the local and national levels. “Significant change will happen but it needs to come from the ground up if we are to be successful,” explains President-Elect Sadikot. “It’s time to call on all leaders to take action on diabetes prevention, early diagnosis and civil society involvement.”

The IDF World Diabetes Congress Vancouver 2015 and World Diabetes Day on November 14 will stand as the worldwide authority underlining IDF’s call to action to halt the diabetes epidemic. “These global platforms will become stronger into 2016-2017 as we transform targets into policy and questions about diabetes into care,” says the President-Elect.

“I am the global reference point for diabetes education and information, including the outstanding epidemiological data provided in the IDF Diabetes Atlas, and as the global advocate, we need to encourage and often demand local and national initiatives for better diabetes education. Time is of the essence. People’s lives are at stake and they matter,” he says.

Translating ground realities

For more than 30 years President-Elect Sadikot has been volunteering, teaching and consulting not only in India but also around the world. The President-Elect believes the world of diabetes care and research has come a long way in a short period of time, but there is still a lot of work to do. He has dedicated time to helping doctors and people living with diabetes in the poorest communities. “It’s not always easy to hear what the realities are,” he explains. “On one occasion, a young man stood up and said, ‘You tell me what I should eat, and I worry if I will eat at all’ which of course changed my perspective on diabetes and the poor. IDF is right on point with the message ‘Nourishing Development’

“I don’t want to lead the diabetes community so much as serve.”
and it is time for all global leaders to take stock of the correlation between healthy eating, development and disease.”

Although the President-Elect believes that progress is moving along, he is also certain that diabetes care is still not getting to the masses. “It’s true the diabetes community has superb conferences, medicines and guidelines, but we need to do more on the ground which is the whole point. It is very hard to sit in London, Brussels or Washington DC and decide what is best for people to do in a developing country.” President-Elect Sadikot believes that what works in one environment doesn’t always work in another, explaining, “Education will be the key to improving prevention, care and changing stigma but that information has to be culturally relevant and appropriate.”

The war on diabetes

In this regard, spearheading global professional education efforts is fundamental to IDF’s incoming President in order to better fight the war against diabetes and diabetes complications. “Today in India alone, diabetes is the largest cause of blindness, largest cause of lower limb amputation. One in three people on kidney dialysis have diabetes, and 70%-80% of people with diabetes die prematurely of heart disease. We know that 95% of all these people see Primary Care Physicians (PCPs). We talk of a war against diabetes, but this is not a war that can be won by sending in drones or dropping in bombs and hoping for the best. We need to have people on the frontlines who know what to do.”

“We need to have people on the frontlines who know what to do.”

For President-Elect Sadikot, the frontline troops in the war against diabetes are the PCPs and in order to succeed, healthcare professionals must receive and understand simplified diabetes care messages. “Many of these professionals tell me, ‘I don’t want to be a diabetes expert, but I do need to know what to do very simply.’” IDF’s D-NET, the first international forum aimed at enhancing diabetes education and management around the globe, offers medical professionals an opportunity to connect with other often more senior diabetes professionals to share, learn and discuss the latest developments. President-Elect Sadikot knows that achieving improved professional education for PCPs, the diabetes educators and other professionals, as well as helping people self-manage more effectively, will be key for success, and D-NET helps give the advantage needed.

IDF Members: making a difference in the field

President-Elect Sadikot has immense respect for all people working for diabetes awareness and care on the ground and he recognises how their efforts can make a significant difference. “IDF’s Members are our strength,” he says. “There are people in the field doing their best to improve outcomes for people with diabetes and I want to put a lot more energy behind that,” he explains. “I want to know more about what IDF Members require and help facilitate appropriate steps for their success.”

“Winning the war against diabetes is not going to be easy, but I am optimistic that we will get there,” says IDF’s President-Elect as he heads back to his medical office and the diabetes frontline.

About the Author

Elizabeth Snouffer is Editor of Diabetes Voice.
Since the stunning discovery in Toronto in 1921 that type 1 diabetes arises from a deficiency of insulin, a novel hormone produced in the pancreas, the management of diabetes has been firmly grounded in scientific advances that continue to shape our understanding of the pathophysiology and guide our choices in selecting optimal therapies for type 1 and type 2 diabetes. As the IDF World Diabetes Congress Vancouver 2015 (WDC15) returns once again to Canada, attendees will find a rich assortment of basic and clinical science lectures, expert sessions, symposia, focused poster sessions and debates to quench their thirst for the latest information on scientific and treatment advances.

After more than 90 years, there continues to be tremendous interest in the science of insulin action, novel insulin analogues and insulin delivery devices. Multiple symposia at WDC15 are devoted to consideration of how insulin works, new insulin analogues, and refinements in delivery of insulin, ranging from new devices to closed loop systems to the latest in islet transplantation and updates in progress for stem cell-derived therapies. The pathophysiology of type 1 diabetes will be extensively discussed, with sessions devoted to genetics, autoimmunity and virus-mediated beta cell toxicity. Similarly, we will review the role of the liver, beta cell, brain, adipose tissue, and the gut in the control of glucose homeostasis in a variety of dedicated scientific sessions.

The complications of diabetes will receive extensive coverage in Vancouver with sessions devoted to oxidative stress, glucolipotoxicity, and both microvascular and macrovascular disease, encompassing retinopathy, neuropathy, nephropathy, hypertension and both endothelial cells and vascular biology. The latest updates in major cardiovascular outcome studies will be provided, with study investigators highlighting new insights from clinical trials examining the safety of DPP-4 inhibitors, GLP-1 receptor agonists, and SGLT2 inhibitors.

Recognising the emerging importance of obesity and its relevance to type 2 diabetes, special sessions will be focused on the management of obesity and its complications, the role of bariatric surgery, and the intersection of obesity and diabetes in special populations, including gestational diabetes, as well as type 2 diabetes and obesity in children and adolescents. The efficacy and safety of new therapies that target both glucose and body weight, principally the GLP-1 receptor agonists and the SGLT2 inhibitors will be reviewed, with special attention to appraising the risk:benefit ratio for individuals living with type 2 diabetes.
Many of the recent advances in our understanding of diabetes have stemmed directly from the application of new technology. Hence, special sessions will feature highlights from studies of epigenetics, new stem-cell technologies, a broad potpourri of “omics” technologies, population genetics, monogenic and polygenic forms of diabetes, advances in immunology and autoimmunity, complemented by updates on early stage drugs in the pipeline for diabetes and its complications.

WDC15 will embrace discussion and controversy, and we look forward to the numerous debates that will rigorously review and discuss all sides of complex basic science and clinical issues. Given the breadth and depth of the programme, perhaps the biggest challenge facing attendees will be the selection of individual sessions and topics. Attendees with a broad range of interest in both clinical and basic science may face scheduling challenges in how to maximize their available time, in deciding which sessions to prioritize. Nevertheless, this is likely to be a challenge we all welcome and the organizing committee looks forward to your participation and feedback during and following WDC15 in Vancouver.

About the Author
Daniel Drucker is Senior Investigator at the Samuel Lunenfeld Research Institute of Mount Sinai Hospital, Professor of Medicine and Director of the Banting and Best Diabetes Centre at the University of Toronto and the Deputy Stream Lead for Basic and Clinical Science WDC15.
Food security top issue for Diabetes in Indigenous Peoples Stream

Malcolm King

The Diabetes in Indigenous Peoples Stream for the International Diabetes Federation World Diabetes Congress 2015 in Vancouver is proud to present a programme where we will explore how the high prevalence of diabetes in indigenous populations is fueled by underlying social, economic and historic factors, including extreme poverty, barriers to education and health care, and the degradation of fragile ecosystems. We will discuss what progress we are making worldwide to cap this tragic epidemic of so many indigenous peoples and how some of these communities are successfully preventing diabetes and related complications leading to disability and early death. Our Stream participants include a broad range of expert stakeholders including global indigenous representatives, international health experts, and renowned researchers.

Food and nutrition insecurity and the burden of high incidence of non-communicable diseases, especially type 2 diabetes, can be found in every corner of the globe, driven by urbanization and the resulting sedentary lifestyles with changing dietary patterns. This situation is especially critical for indigenous peoples, who experience the most severe financial poverty and health disparities in both developing and developed countries, particularly where they depend on ecosystems under stress to support their needs for food and well-being.

Malcolm King, Scientific Director of the CIHR Institute of Aboriginal Peoples’ Health will chair the IDF Award Lecture entitled “Food and nutrition security in indigenous populations,” given by Harriet V. Kuhnlein, Professor Emerita of Human Nutrition, and Founding Director of the Centre for Indigenous Peoples’ Nutrition and Environment (CINE) at McGill University. In the lecture, the awardee will discuss the challenges faced by indigenous peoples in protecting their traditional knowledge and use of their local foods for physical, social and environmental health and learn what initiatives are improving indigenous peoples food systems and health nutrition.

In IDF’s Teaching Lecture series, Alex Brown, an indigenous doctor who has been working in Aboriginal Health in Australia will address the dynamic concept of “cultural safety” in indigenous peoples’ diabetes care along with Leslie Varley, Director of Aboriginal Health Services in British Columbia.

Historical trauma in indigenous communities combines with poverty and ongoing discrimination to produce profound feelings of sadness, anxiety, depression, anger and estrangement. Jeffrey Henderson, a member of the Cheyenne River Sioux tribe and president and CEO of Black Hills Center for Native American Health will chair an open Forum on the “Historical and current trauma...
as a determinant of diabetes in Indigenous people.”

The Diabetes in Indigenous Peoples Stream will cover those communities in crisis at the far corners of the globe. Ann Ragnhild-Broderstad, Academic Director of the Centre for Sami Health Research at the Artic University of Norway will present data on risk factors for diabetes among the Sami peoples of Norway. Elaine Rush, Professor of Nutrition at the Auckland University of Technology in New Zealand will present on prevention of diabetes among Maori peoples. These two experts will certainly provide great insight into the current challenges for these communities today.

Many symposia will be presented on integrated chronic disease strategies for indigenous peoples such as a discussion on a community driven quality improvement initiative as well as a lecture on primary and secondary diabetes prevention. An international panel of speakers will address the critical subject of diabetes associated micro- and macro-vascular diseases. Early-life environments and diabetes in pregnancy will be discussed as well as an in-depth look at how to reduce the risk of diabetes for future generations.

We look forward to welcoming your interest and lively discussions on the effect of health disparity and diabetes in indigenous peoples. Our panel of experts will certainly help us understand and explore the rich and diverse cultural knowledge of these communities and how they hold a positive influence on the economic, social and political dynamics of many regions.

About the Author
Malcolm King is Scientific Director of the CIHR Institute of Aboriginal Peoples’ Health and Stream Lead for Diabetes in Indigenous Peoples at WDC15.
Hypoglycaemia, a global cause for concern

Simon Heller, Stephanie A. Amiel, and Kamlesh Khunti on behalf of the International Hypoglycaemia Study Group

Hypoglycaemia in diabetes is often considered to be relevant only to those with type 1 diabetes (T1D). Evidence has long been available that hypoglycaemia occurs in people with type 2 diabetes (T2D) using sulphonylureas. (Episodes will be more prolonged than with insulin alone.) However, the risk of hypoglycaemia in people with T2D has received little attention with the implication that it can be ignored.

In this short review, we argue that recent research shows that hypoglycaemia as a clinical problem is an important concern in T2D. In addition, since insulin treated T2D is more common that T1D, it presents an equal challenge, particularly since most individuals are cared for by the non-specialist, including general internist and primary care teams who may not fully understand the risks associated with hypoglycaemia.

Data emerging from recent clinical trials have generally given the impression that rates of severe hypoglycaemia in both types of diabetes are steadily falling and that, for T1D, they are now much lower than in the landmark Diabetes Control and Complications Trial, completed over 20 years ago. However, since clinical trials, by design mean that patients are treated strictly according to protocol (with considerable support from research and nursing staff) and that individuals with hypoglycaemia problems are specifically excluded, trials may underestimate the risk of hypoglycaemia compared to rates observed in routine clinical practice.

The Hypoglycaemia Assessment Tool (HAT) study (Figure 1) is a recently completed observational multi-centre epidemiological survey of over 27,000 people with T1D and T2D on insulin from 24 countries. The study aims were to measure the frequency, predictive factors and consequences of hypoglycaemia (both severe and symptomatic) in a variety of countries including developing countries, such as Argentina, Mexico and India. What was striking about the results was the frequency of hypoglycaemia compared to previous surveys.

Self-reported rates of severe hypoglycaemia (defined as needing the help of another person for recovery) were around 5 times higher than previous population based reports. Among insulin treated patients with T2D, the overall rate of severe hypoglycaemia was around 2.5 per person per year. Even allowing for limitations regarding the methodology of online reporting and the possibility that some individuals were self-selected, these are alarming results. Some of the highest rates were seen in developing countries.

Recent trials have suggested that the consequences of severe episodes may extend beyond those already well-recognised due to impaired cerebral function, which include impaired awareness, risk of accidents while driving and coma. The premature termination of the ACCORD trial was due to increased mortality in the intensive arm where there was a particularly aggressive approach to glucose control, associated with high rates of severe hypoglycaemia, startled the diabetes community. A number of subsequent studies have confirmed the association between severe hypoglycaemia and subsequent death downstream of the
of the event.\textsuperscript{6,7}

Although the data suggest hypoglycaemia was not the direct cause of the excess deaths in ACCORD, other research has identified plausible mechanisms whereby hypoglycaemia might lead to a cardiac death downstream.\textsuperscript{8-10} One study has reported prolonged asymptomatic hypoglycaemia at night associated with cardiac arrhythmias in patients with known cardiovascular disease.\textsuperscript{11}

Why is hypoglycaemia so common and what can be done to address the worrying situation described above? This question needs to be addressed with a global perspective, recognising that many countries lack the resources to use expensive technology such as insulin analogues, insulin pumps and continuous glucose monitoring. Even where available, most patients are not cared for by specialist teams with the expertise to use these devices.

**Addressing basic principles**

Many underlying drivers of hypoglycaemia are well recognized. Furthermore, some of the most effective methods of prevention are relatively cheap and affordable even within healthcare systems short of resources.

From the point of view of the health care professional, the three underlying principles are:

1. Individualizing targets (with appropriate therapies) and adjusting these when individuals are particularly vulnerable to hypoglycaemia or its consequences.

2. Structured education/training for people with diabetes.

3. A health care team alert to potential problems with hypoglycaemia.

Recent publications, some described above, have established the case for individualizing therapy which has been endorsed by national and internationally approved guidance.\textsuperscript{12}

For those individuals recently diagnosed with T2D who require treatment with lifestyle advice and metformin, tight glucose targets are appropriate with HbA\textsubscript{1c} levels as low as possible with no risk of hypoglycaemia. When glucose levels rise, some agents such as incretin therapy or glucosidase inhibitors (when affordable) carry no risk of hypoglycaemia and can also be used knowing that they won’t increase the risk of hypoglycaemia. These should be the treatments of choice when the risk of hypoglycaemia is considered particularly high, e.g., people in high risk occupations or who report problematic hypoglycaemia.

However, if the affordable choice of treatment requires the use of insulin secretagogues such as sulphonylureas, additional actions by the healthcare professional (HCP) are needed. Firstly, only sulphonylureas with a shorter duration of action should be prescribed. Additional safety measures include: checking renal function; starting medication at a low dose; warning patients about the symptoms of hypoglycaemia; and urging them to report episodes to their professional carers. If possible, individuals taking sulphonylureas should learn to test their blood glucose with clear instructions to eat regularly, test their blood glucose if they have symptoms and take
action if their blood glucose falls below 70 mg/dl (4mmol/L).

For those patients who require insulin to achieve targets, the above instructions also apply. It is important to note that basal insulin replacement alone carries a lower risk of hypoglycaemia than regimens including fast acting insulins, although patients with greater insulin deficiency will need both to achieve glycaemic control. For people with established, long duration diabetes and those affected with complications (some such as renal impairment or known CVD are particularly important), then more realistic and safe glucose targets should be agreed. Some now propose HbA1c levels at or just below 8% (63.9 mmol/mol) as appropriate.13

There is now substantial evidence (mostly obtained in studies involving adults with T1D) that structured training and education programmes not only improve HbA1c levels but substantially reduce rates of severe hypoglycaemia (and diabetic ketoacidosis) in insulin users (Figure 2).14-16 It seems self evident that patients should receive systematic training to use a life-saving medication like insulin (with potentially dangerous side-effects if used inexpertly) safely, but even in countries with well developed healthcare systems, the proportion of individuals who receive such training is alarmingly small.

Important principles for the HCP to convey include detailed instruction about the duration and variability of different insulins, appropriate use of glucose monitoring and corrective insulin doses and understanding the effects of food, particularly carbohydrates, on blood glucose. From the point of view of the individual living with either T1D or T2D (and their immediate family), a good layman’s understanding of hypoglycaemia is essential. In particular, a knowledge of the range of hypoglycaemic symptoms, how to treat without overcorrection and an appreciation that repeated episodes can diminish the warning symptoms that predict a severe attack (also called hypoglycaemic unawareness).

It is also critical for the HCP to communicate the importance of the alert level of 70 mg/dL (4 mmol/L) as a signal to which respond to immediately to prevent hypoglycaemia sufficient to impair cognitive function < 55 mg/dL (3 mmol/L), and also to consider the need to adjust future insulin dose.17 Indeed, HCPs should make sure they assess hypoglycaemia awareness in everyone at risk (if symptoms are not felt before the blood glucose has fallen below 3 mmol/L, the patient is at higher risk for severe hypoglycaemia). HCPs should also be aware that hypoglycaemia can present as dementia in the older patient, and be accepted as such by family members. The importance of identifying nocturnal episodes (usually asymptomatic) should be recognised and can be detected, in the absence of continuous glucose monitoring (CGM), by testing occasional overnight blood glucose. Addressing these basic principles is within the capability of all professionals who care for people with diabetes and should be part of a standard care pathway.

Technological innovations such as CGM and insulin pump therapy are helpful but will remain prohibitively expensive.
and unavailable for many years for the vast majority of people with insulin treated diabetes. In the meantime, we have a duty to ensure that many more individuals receive basic and effective treatment which allows them to minimise the risk of hypoglycaemia and achieve glucose targets safely. The most important message is to make sure that our HCPs are actively and adequately assessing and managing the risk of hypoglycaemia for each person living with diabetes.

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The International Hypoglycaemia Study Group (IHSG) is a learned panel of healthcare professionals who examine issues associated with the problem of hypoglycaemia in people with diabetes. The IHSG seeks to improve the scientific understanding of hypoglycaemia, as well as its importance as a barrier to optimal glycaemic control, by means of raising awareness.

References


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