TDC Insights

November 2023

TDC Newsletter Featuring Diabetes Research & Developments

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Celebrating Diabetes Awareness Month: A Recap of Our Impactful Initiatives

Dear Readers,

We are delighted to share the success of The Diabetes Centre Islamabad's month-long celebration of Diabetes Awareness Month, aligning with the global observance of World Diabetes Day. Throughout the month, we engaged in a series of impactful activities aimed at spreading awareness, providing screenings, and offering support to individuals affected by diabetes.

The celebration kicked off with a **press conference held at the prestigious National Press Club.** This event aimed to shine a light on the critical importance of diabetes awareness in our community. Our CEO shared valuable insights into the rising prevalence of diabetes and the urgent need for proactive measures in its prevention and management.

Taking our mission to the heart of the city, the Diabetes Centre organized **Diabetes Awareness Camps** at prominent locations such as **Centaurus Mall, Bestway Cement, and Lok Virsa Mela.** These camps were strategically located to reach diverse audiences, allowing us to interact with people from various walks of life. Our dedicated team conducted screenings, provided valuable information, and offered immediate medical attention to those in need.

What's inside this issue?

The highlight of our month-long celebration was the **Awareness Walk held at F9 Park**. The community came together to participate in this meaningful event, emphasizing the collective responsibility we bear in understanding and managing diabetes. The walk served as a powerful symbol of unity and commitment to promoting a healthier and more informed society.


As a culmination of our efforts, **The Diabetes Centre hosted a special event on the hospital premises.** We were honoured to welcome esteemed guests who generously supported our cause. Their presence and encouragement further reinforced our commitment to raising awareness about diabetes and its impact on individuals and communities.


We express our gratitude to everyone who participated, supported, and contributed to the success of these initiatives. It is through such collective efforts that we can make a lasting impact on the health and well-being of our community. Our commitment to diabetes awareness and patient care extends beyond this month. We remain steadfast in our mission to educate, empower, and support those affected by diabetes.
Together, let us continue to work towards a healthier and more informed future.

Inaugural Meeting of TDC Research Committee

On November 18th, the inaugural meeting of the Research Committee was held. The committee is well represented by various departments and is Chaired by two members of TDC Board of Directors. The Research Committee members include:

1. **Dr. Imran Mirza, Chair**
2. **Dr. Asrar Khan, Co-Chair**
3. **Dr. Faizan Nihal**
4. **Dr. Farah Faizan**
5. **Dr. Sonia Bakhtiar**
6. **Mr. Muhammad Attique**
7. **Mr. Manzoor Awan**
8. **Dr. Ismail Khan**
9. **Dr. Saadia Zafar**
10. **Mr. Subhanullah**
11. **Mr. Zaheer Ahmad**
12. **Ms. Maryam Shahid, Secretary**

The committee reviewed its purpose, members' motivation to serve and their aspirations. Approval was granted for the proposed research collaboration with the National Skills University. All members unanimously agreed that ongoing projects should be presented to the Research Committee for suggestions and improvements.

Featured Research

Harnessing the Power of AI: Predicting Diabetes Onset Before It Strikes

In recent research breakthroughs, the application of artificial intelligence (AI) methods has proven to be a game-changer in forecasting the onset of diabetes. One notable study implemented an automated diabetes prediction system using a private dataset of female patients in Bangladesh. Employing machine learning (ML) techniques such as extreme gradient boosting and

ensemble methods, the system demonstrated an impressive 81% precision rate in forecasting insulin characteristics. This highlights the potential for AI to provide precise insights into the early stages of diabetes.

Another significant study focused on the development of an AI-based prediction model for gestational diabetes mellitus (GDM) in pregnant Mexican women. Using an innovative artificial neural network approach, the model achieved a notable accuracy of 70.3% and an impressive sensitivity of 83.3% in identifying women at high risk of developing GDM. The overarching goal of this AI model is to enhance the timing and quality of GDM interventions, allowing for prioritized preventative treatment and improved maternal health outcomes.

In addressing a major complication of diabetes, diabetic macular edema (DME), researchers took a proactive approach by developing an AI clinical decision-making tool. This tool utilized a knowledge graph and an advanced correlation enhancement algorithm to comprehensively examine factors influencing DME. The resulting model showcased exceptional efficacy and accuracy, accurately predicting DME with a precision rate of 86.21%. The introduction of this clinical decision support system allows for individualized disease risk prediction and timely intervention, marking a significant advancement in managing diabetes-related complications.

These studies collectively emphasize the successful application of AI methods in predicting diabetes, showcasing high levels of accuracy and efficiency in identifying individuals at risk. As the field continues to evolve, these innovations hold the potential to revolutionize diabetes management, offering personalized insights that can lead to more effective preventative strategies and improved patient outcomes. The integration of AI in diabetes research is a promising step forward in the ongoing effort to enhance the understanding and treatment of this prevalent and challenging health condition.

Plant-based swaps may cut diabetes and heart disease risk, major review finds

Analysis of 37 studies finds largest health benefits come from replacing processed meat, with 20% reduction in type 2 diabetes.

A recent comprehensive review conducted by researchers in Germany suggests that substituting meat and dairy with plant-based alternatives like whole grains, beans, nuts, and olive oil may offer substantial benefits in reducing the risk of cardiovascular disease and type 2 diabetes. The analysis of 37 published studies revealed significant decreases in both health conditions and a lower overall mortality risk when individuals replaced red and processed meat, poultry, fish, eggs, and dairy with plant-based options such as nuts, legumes, whole grains, oils, fruits, and vegetables.The findings underscore the potential advantages of transitioning from animal-based diets to plant-based foods, emphasizing the importance of incorporating nuts, legumes, whole grains, and olive oil into daily nutrition. The study indicates that replacing 50g of processed meat with nuts or legumes may lead to a 25% lower risk of cardiovascular disease, while substituting one egg with 25g of nuts is associated with a 17% lower risk. Similar benefits were observed for type 2 diabetes, with a potential 20% reduction when swapping 50g of processed meat for up to 28g of nuts or replacing a daily egg with 30g of whole grains or 10g of nuts.

Notably, the study highlights that the clearest health benefits were observed when replacing processed meat, particularly red meat in forms like ham, bacon, sausages, or hotdogs. The research does not delve into specific reasons for these health benefits, but it is suggested that meat, especially red and processed varieties, may contain saturated fatty acids that elevate the risks of cardiovascular disease and type 2 diabetes. Conversely, plant-based foods offer essential nutrients such as fiber, vitamins, minerals, antioxidants, and phytochemicals that may mitigate inflammation. However, the study does not distinguish between various types of dairy, and some evidence suggests that fermented dairy products like yogurt and cheese may have health benefits.

Additionally, the research does not explore the effects of replacing red and processed meat with other animal-based foods like fish, poultry, and eggs. While the study calls forfurther high-quality research, experts suggest a prudent focus on reducing red and processed meat intake, considering both potential adverse health impacts and environmental concerns.

T2D: Real Benefits of New Oral Antidiabetic Drugs

Cardiovascular disease is the most common cause of death in people living with type 2 diabetes (T2D). It is true that patient prognoses have improved with the use of metformin and by addressing cardiovascular risk factors. But the new oral antidiabetic drugs, SGLT2 (sodium glucose cotransporter-2) inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1Ra),

offer fresh therapeutic approaches. Several recent controlled studies and meta-analyses have demonstrated the possibility of a cardioprotective and nephroprotective effect, even in patients without diabetes, especially with regard to SGLT2 inhibitors.
A comprehensive retrospective cohort study, involving over 2.2 million Type 2 Diabetes (T2D) patients on insulin across three countries, assessed the practical effectiveness of SGLT2 inhibitors (SGLT2i) and GLP-1 receptor agonists (GLP-1Ra). Divided into monotherapy and combination groups, including SGLT2i alone, GLP-1Ra alone, and a combination of both, alongside a control group, the study employed propensity score matching.
The findings, analyzed over a 5-year follow-up, demonstrated substantial real-world benefits. In inter-group comparisons, the study highlighted significant reductions in all-cause mortality, admissions rates, and myocardial infarction rates for patients on SGLT2i, GLP-1Ra, and their combination.

A noteworthy sub-analysis emphasized the synergistic effect of combining SGLT2i and GLP-1Ra, revealing a more pronounced reduction in all-cause mortality compared to SGLT2i monotherapy and GLP-1Ra monotherapy.

Diabetes Linked to Higher Colorectal Cancer Risk

A recent study, led by Andersen and a team of researchers, delves into the complex relationship between diabetes duration and the risk of colorectal cancer (CRC). Their findings suggest a connection between a shorter duration of diabetes and an elevated risk of CRC.
According to Andersen and the team, the intensified CRC testing may initially contribute to an increase in CRC cases by detecting prevalent CRCs. However, over the long term, this heightened screening may result in a reduced risk of CRC, emphasizing the preventive function of screening against colorectal cancer.
The researchers emphasize the significance of increased healthcare interactions, including referrals to CRC screening, in mitigating the potential harm of diabetes-related metabolic dysfunction on CRC risk, particularly in the early stages of diabetes.

This study builds upon previous epidemiological research that has indicated a link between diabetes and an increased risk of CRC. Factors such as hyperglycemia and hyperinsulinemia associated with diabetes may support the growth of cancer cells, with hyperinsulinemia potentially increasing CRC risk through various pathways.

Robert Gabbay, MD, PhD, Chief Scientific and Medical Officer of the American Diabetes Association, expressed that the study's findings are unfortunately not surprising, given the known increased risk of various cancers in people with diabetes, especially those with obesity. Gabbay underscores the importance of appropriate screening for colorectal cancer, emphasizing the effectiveness of identifying precancerous lesions and ensuring close follow-up as a strategy to lower the risk of colorectal cancer.

Interesting Case Report

Purple Urine Bag Syndrome

In a rare and intriguing case, a 50-year-old male resident of Barakahu presented to the outpatient department with an unusual complaint - purplish discoloration of urine. This phenomenon, persisting for the past 2 months, was accompanied by burning micturition and increased frequency of urination, causing significant concern for the patient, family members, and healthcare workers alike.

The patient, wheelchair-bound for the past 20 years due to lower body paralysis resulting from a fall, had a history of recurrent episodes of similar discoloration, all managed with oral antibiotics and catheter changes. Seeking medical attention for T2DM screening, the patient reported no known comorbidities.

Upon examination, the patient was conscious, oriented, and wheelchair-bound, with urinary and fecal incontinence. Vital signs were within normal limits, and systemic examination revealed no remarkable findings. However, urine analysis unveiled a striking picture - pH greater than 9.0, elevated nitrates, protein, hemoglobin, and leucocytes. Further investigation into urine and catheter tip cultures revealed a heavy mixed bacterial growth of over 100,000 cfu/ml, involving at least three bacterial species.

The patient was promptly started on a treatment regimen, including ciprofloxacin and lactulose. The urinary catheter bag was replaced, and oral hydration was encouraged. A follow-up four days later revealed a reassuring outcome - the replaced catheter bag

remained normal in color, and a subsequent urine sample showed no bacterial growth, indicating resolution of the urinary tract infection. This peculiar presentation falls under the umbrella of Purple Urine Bag Syndrome (PUBS), a rare clinical entity first reported in The Lancet in 1978. Despite its rarity and limited understanding, PUBS has been observed in 9.8% to 16.7% of certain cohorts of long-term catheterized patients. The hypothesized pathophysiology involves a cascade of reactions initiated by the dietary intake of tryptophan, leading to the production of indigo and indirubin pigments responsible for the distinctive purple staining of the PVC lining of the urinary catheter bag.

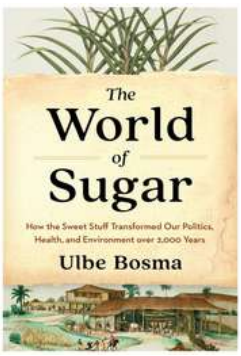
Various risk factors contribute to the occurrence of PUBS, including constipation, female gender, high bacterial load in the urinary tract, an alkaline urine environment, and a diet rich in tryptophan. Notably, bacteria species such as Providencia stuartii and Klebsiella pneumoniae are commonly implicated. The bacterial enzymes involved in PUBS have indoxyl sulphatase and indoxyl phosphatase activity, crucial for the production of indigo pigment.

This case emphasizes the significance of recognizing PUBS as a valuable clinical sign aiding in the diagnosis of urinary tract infections, particularly in catheterized patients. Further research is warranted to unravel the mysteries surrounding this fascinating clinical phenomenon and to explore preventive strategies in patient care.

Educational Resources

Book Review

In our ongoing pursuit of knowledge and understanding surrounding diabetes and its historical context, we bring to you a compelling book that delves into the intricate history of sugar – **"The World of Sugar" by Ulbe Bosma.**



The rise of sugar as a societal staple is relatively new. While people in India have been consuming granulated sugar since the 6th century BC, it was not until the 19th century that refined sugar became common in Europe. Historian Ulbe Bosma has thoroughly explored this journey in this comprehensive and engaging work. He presents it as a narrative of advancement tinged with the dark aspects of exploitation, racial injustice, health impacts, and ecological harm. Notably, he points out that of the 12.5 million Africans forcibly taken across the Atlantic during the slave trade, half to two-thirds ended up laboring on sugar cane farms.

Editorial Board

Feedback

We are excited to hear from you. Please send us your feedback at **rc@tdc.com.pk**

"The greatest wealth is health"
Virgil