DRS-WCPD: 11th World Congress on Prevention of Diabetes and Its Complications

METFORMIN IN PREGNANCY: HAAN KI NAA?

Dr Rajeev Chawla, New Delhi; Dr Shalini Jaggi, New Delhi; Dr Mayura Kale, Aurangabad

- Metformin remains the most effective drug for managing hyperglycemia in gestational diabetes mellitus (GDM), although its exact mechanisms are not fully understood.
- Metformin is a standard treatment option for pregnant patients with a history of type 2 diabetes (T2D), GDM, or any degree of hyperglycemia detected during the second or third trimester.
- However, the blood glucose targets for pregnant women are very stringent (fasting blood sugar [FBS]: 90 mg/dL and postprandial blood sugar [PPBS]: 120 mg/dL). If metformin is insufficient for managing glucose levels, insulin may be initiated.
- According to guidelines, insulin is the primary treatment for any dysglycemia in pregnant women who do not achieve target glucose levels with medical nutrition therapy or lifestyle changes alone.
- Adding metformin can be beneficial for pregnant women with T2D on insulin who require higher doses.
- Additionally, metformin should be prescribed if insulin administration is problematic due to availability, cost, or the patient's inability to selfadminister or self-monitor.
- The few contraindications to metformin include fetoplacental insufficiency, intrauterine growth restriction, hypertension, and pre-eclampsia. Patients with these conditions should be started on insulin immediately.
- In high-risk pregnancies, such as those involving macrosomia or small-for-gestational-age babies, insulin should not be delayed.
- For women with polycystic ovary syndrome, metformin is the safest drug for managing blood glucose levels. Although the ADA guidelines recommend discontinuing metformin after 12 weeks, studies have shown that continued use can prevent the progression from mild dysglycemia to GDM.

Clinicians should advocate for early blood sugar testing (postprandial glucose [PPG] >110 mg/dL) during pregnancy rather than waiting for the development of GDM in the second or third trimester before initiating treatment.

Overall, metformin is considered safe for use during pregnancy, and insulin should be added when metformin alone is insufficient for glycemic control. In 30% to 40% of clinical situations, patients may require insulin in addition to metformin to manage their blood glucose levels effectively.

CGM AS A GUIDE FOR DIETARY INTERVENTIONS

Dr Suhas Erande, Pune

The role of food-based dietary strategies in achieving T2D remission has gained significant attention, particularly with the rise of Mediterranean and plant-based diets. Continuous glucose monitoring (CGM) technology has shown promise in refining diet and lifestyle adjustments, but its application has limitations. Recent editorial critiques highlight that promoting CGM for nondiabetics may lack sufficient evidence and could potentially lead to eating disorders. For newly diagnosed patients reluctant to start medication, CGM can offer valuable insights, helping to reduce instances of hypoglycemia and hyperglycemia. It provides a feedback loop that enhances dietary adherence and overall health outcomes. Studies have demonstrated that dietary responses can vary significantly due to factors such as microbiota and food additives in processed foods.

To optimize the use of CGM, integrating it with personalized dietary guidance can be highly effective. Health care providers can use CGM data to offer tailored meal timing and composition advice, thereby stabilizing blood sugar levels. Practical strategies include:

- Focusing on one meal at a time and modifying it if PPG is high, such as substituting rice with more vegetables or lentils.
- Advising patients to keep a food diary to better correlate with glucose spikes from the ambulatory glucose profile.
- Teaching patients to monitor their time-in-range for motivation.

- Explaining the impact of exercise and stress on glucose levels.
- Encouraging experimentation with different diets, such as low-carb or high-protein, or sequencing foods to manage PPG spikes effectively.

FETAL ORIGIN OF TYPE 2 DIABETES

Dr CS Yajnik, Pune

- The fetal origins of T2D emphasize the critical role of early life nutrition and development in determining long-term health outcomes.
- In Indian populations, research has shown that both undernutrition and overnutrition during gestation can increase the risk of T2D in later life.
- This phenomenon, often described as the "thrifty phenotype", suggests that the fetus adapts to a limited supply of nutrients by developing insulin resistance and other metabolic changes.
- Although beneficial in the short-term, it predisposes the individual to diabetes and other chronic diseases in adulthood.
- The Pune Maternal Nutrition Study highlighted the significance of maternal nutrition before and during pregnancy in shaping the metabolic health of offspring.
- Children born to undernourished mothers were found to have lower birth weights and were more prone to developing central obesity and insulin resistance as they aged.
- Overall, early interventions aimed at improving maternal nutrition and fetal growth conditions are essential to break the cycle of diabetes transmission and reduce the burden of T2D in future generations.

NOVEL NONPHARMACOLOGICAL TREATMENT OF DIABETES: GRYLLUS BIMACULATUS

Dr Sam-Goo Lee, South Korea

Gryllus bimaculatus, commonly known as two-spotted crickets, has emerged as a promising sustainable protein source. It is rich in essential amino acids and unsaturated fatty acids and offers significant benefits for managing diabetes and other health conditions. Clinical evidence has demonstrated the glucose-lowering effects of cricket powder through the AKT/mTOR pathway, providing a novel approach to diabetes management.

The "D&D" (Diabetes and Dietary) trial, which involved 1,000 patients using a dietary supplement derived from crickets, confirmed the therapeutic effects of this

alternative protein in managing diabetes. In the trial, patients were classified into eight groups: Juvenile-T1DM (<17 years), Adult-T1DM (Originated from LADA and T2DM), LADA (latent autoimmune diabetes in adults), etc.

Every 3 months, the patients were more than 20 different parameters such as glycated hemoglobin (HbA1c), microalbumin, fasting blood glucose, postprandial 2 hours, insulin resistance, homeostasis model assessment of insulin resistance (HOMA-IR), low-density lipoprotein (LDL), high-density lipoprotein (HDL), etc.

Key findings include:

- HbA1c levels reduced from 12% to 6.5% within 3 months.
- Patients with T1D showed recovery in C-peptide levels and insulin secretion.
- Extremely high triglyceride levels (1,400 mg/dL) were normalized in 3 months.
- Improvement in diabetes-related complications, including:
 - Diabetic retinopathy
 - Peripheral neuropathy/numbness in the hands and feet
 - Nighttime urination reduced from 3 times to 1 time
 - Hyperglycemia/hypoglycemia
 - Hypertension
 - Hyperlipidemia
 - Erectile dysfunction, with increased testosterone levels
 - Hemiparalysis and obesity.

HOW TO PREVENT FATTY LIVER IN PEOPLE WITH DIABETES AND PREDIABETES?

Dr Juan Pablo Frias, USA

- The global prevalence of MASLD (metabolicassociated steatotic liver disease) in patients with T2D is approximately 65%.
- Fibrosis is the most significant prognostic factor in MASLD and is correlated with liver-related outcomes and mortality.
- Advanced fibrosis identifies patients requiring indepth hepatological evaluation, including case-bycase confirmatory biopsy and intensive therapy.
- Primary care physicians, endocrinologists, gastroenterologists, and obesity specialists should screen

CONFERENCE PROCEEDINGS

for MASLD with advanced fibrosis using a fourstep approach:

- Step 1: Identify patients at risk.
- Step 2: Conduct a thorough history and laboratory tests, including alcohol intake assessment, complete blood count (CBC), and liver function tests.
- Step 3: Perform noninvasive testing for fibrosis.
- Step 4: Measure liver stiffness.
- Approved and emerging pharmacotherapies for MASLD include resmetirom, pegozafermin, semaglutide, survodutide, tirzepatide, and others.

A case of a 64-year-old Latino man with a 14-year history of T2D was discussed. The patient presented with symptoms of hepatic steatosis on abdominal ultrasound.

- Based on the Fib-4 score and liver stiffness measurement, the patient was diagnosed with an intermediate risk for advanced hepatic fibrosis.
- The treatment plan included lifestyle modifications, initiation of glucagon-like peptide-1 (GLP-1) receptor agonist-based therapy, and sodiumglucose cotransporter 2 (SGLT2) inhibitors, along with continued metformin and basal insulin (at a reduced dose).

HOW TO ELABORATE AND/OR VALIDATE RISK SCORES FOR DIABETES AND CARDIOVASCULAR COMPLICATIONS?

Dr Noel Barengo, USA

Two strategies can be used to identify a high-risk population for diabetes and hyperglycemia: a one-step strategy involving diagnostic tests such as oral glucose tolerance test, HbA1c, etc., or a two-step strategy. The two-step strategy includes using diabetes risk scores followed by diagnostic tests.

According to Wilson's criteria for screening, the condition should be an important health problem, and its natural history should be understood. There should be a recognizable latent or early symptomatic stage, and the screening test should be easy to perform, interpret, acceptable, accurate, and sensitive. Additionally, there should be an accepted treatment for the disease, which is more effective if started early. Policies should be established regarding who should be treated, focusing on cost-effective diagnosis and treatment, and case finding should be a continuous process. The objective of developing FINDRISC was to create a simple, economical, and reliable tool that can be easily applied to the general population without requiring blood extraction.

Overall

- Validated screening tests exist.
- These screening tests have been successfully validated and implemented in various countries.
- Key challenges include monitoring attendance, determining short- and long-term benefits, implementing guidelines, and determining the appropriate time interval for screening tests.

MICROBIOTA AND THE PREDICTION OF PREDIABETES AND TYPE 2 DIABETES

Dr Rupjyoti Talukdar, Hyderabad

The gut microbiome, composed of diverse bacteria, fungi, and other microorganisms, regulates digestion, immune function, and overall health. Recent research has highlighted its potential in predicting diabetes and prediabetes. Shifts in the microbiome composition, often influenced by diet and lifestyle, have been linked to metabolic diseases, including diabetes.

- Emerging research suggests that microbiome alterations may precede the onset of diabetes and prediabetes, offering a potential predictive tool. For example, a Finnish study identified bacterial changes during pregnancy that could predict postpartum prediabetes.
- Similarly, a German study recognized microbiome patterns that appeared before developing T2D. These findings suggest that microbiome profiling could aid in the early detection and prevention of diabetes.

However, there are several challenges to overcome, such as:

- While some studies have linked microbiome changes to disease, few have successfully predicted disease onset.
- More large-scale research is needed to validate these findings, particularly in diverse populations like India.
- A multimodal approach incorporating clinical, biochemical, and lifestyle factors.
- Adding metabolomics to studies is crucial for improving prediction accuracy and translating microbiome insights into reliable clinical applications for diabetes management.