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

ENHANCING LONGEVITY IN DIABETES – A THOUGHT FROM THE BEGINNING

Dr NK Singh, Dhanbad

Diabetes is a major cause of premature death and disability. One critical factor in the progression of type 2 diabetes complications is the interaction between oxidative stress and cellular dysfunction, particularly in the mitochondria. This leads to endothelial cell dysfunction. Additionally, chronic metabolic overload can damage the mitochondrial network, compromising mitochondrial DNA and function, which increases the risk of age-related diseases and premature functional decline. Fortunately, several strategies can help address and halt this progression:

- Lifestyle interventions: Lifestyle changes are among the most effective methods for managing diabetes. A balanced diet, regular exercise, and practices such as intermittent fasting can improve glucose control and reduce oxidative stress, thereby slowing the progression of diabetes and its complications.
- Respecting circadian rhythms: Following circadian rhythms, a principle rooted in ancient Indian wisdom, can significantly enhance metabolic health. Meal timing and dietary components (chrononutrition) play a crucial role in regulating circadian clocks, promoting longevity, and reducing the risk of type 2 diabetes.
- Pharmacological interventions: Certain medications can help maintain metabolic health and manage diabetes. Drugs like metformin, pioglitazone, glucagon-like peptide-1 receptor agonists, and sodium-glucose cotransporter 2 (SGLT2) inhibitors effectively control blood sugar, reduce oxidative stress, improve insulin sensitivity, and preserve endothelial function.

HOW TO PREVENT DFU WITH A REGULAR CLINICAL BIOCHEMICAL EXAMINATION AT ALL LEVELS OF HEALTH CARE

Dr Arun Bal, Mumbai

The mechanism behind diabetic foot ulcers (DFU) highlights that impulse loading, rather than just high pressure, plays a critical role. Impulse loading, defined as the product of pressure and ground contact time, is more relevant in causing injury. Patients with diabetes may need to adjust their exercise routines since pressure between 500 to 700 Kpa is the threshold for injury; faster gaits and longer strides increase pressure. Certain exercises are restricted for individuals with diabetic feet, including those with insensate or deformed feet, existing or previous ulcers, and activities like treadmill use, prolonged walking, jogging, and using stair masters. Unprotected walking can further damage the feet in diabetes, making it essential to go beyond wound healing and focus on biochemical correction to prevent a recurrence. To effectively reduce the risk of amputations, there is a need for comprehensive acute diabetic foot care units that address all aspects of foot care in diabetes.

REVISITING GLOBAL LANDMARK TRIALS FOR DIABETES PREVENTION

Dr Amit Gupta, Noida

Global type 2 diabetes prevention trials have provided valuable insights into effective interventions. Dietary strategies across studies consistently aimed at energy restriction, fat reduction, and increased fiber intake, with significant weight loss observed in the Diabetes Prevention Program (DPP) and the Finnish Diabetes Prevention Study (DPS) studies. Physical activity was universally emphasized, with goals such as 150 minutes per week in the DPP and daily walking in the Japanese impaired glucose tolerance (IGT) trial. Long-term follow-up was crucial for assessing the sustainability and impact of these interventions, which consistently showed that lifestyle changes outperformed other methods, including metformin alone, with the Japanese IGT trial achieving a 67% risk reduction. The reduction in diabetes incidence was independent of initial body weight, with those meeting multiple lifestyle targets benefiting the most, although weight reduction remained critical for overweight individuals. While lifestyle interventions delayed type 2 diabetes onset by at least 5 years, a residual risk persisted, particularly among those unable to fully adhere to lifestyle targets. Notably, individuals with a high genetic predisposition

to diabetes have benefited significantly from these interventions.

It can be concluded after revisiting the landmark trials; Pioneering studies like Da Qing, DPS, and DPP have demonstrated that lifestyle interventions can significantly reduce type 2 diabetes risk across diverse populations. These trials have a global impact, serving as the foundation for national and international type 2 diabetes prevention programs. These studies have also shown the lasting impact of early lifestyle interventions in delaying or preventing type 2 diabetes onset. Real-world implementation continues to be an ongoing key challenge. Moving forward, building on the success of these trials, future efforts should focus on adapting proven strategies to diverse settings.

IMPORTANCE OF VITAMIN D IN PREDIABETES

Dr Anil Bhoraskar, Mumbai

Vitamin D is vital in managing diabetes, prediabetes, and related health conditions. Its deficiency is linked to decreased insulin release and increased insulin resistance, key factors in developing type 2 diabetes. Studies have shown that maintaining sufficient vitamin D levels reduces the risk of progressing from prediabetes to diabetes, with supplementation showing a 10% to 13% reduction in this risk, regardless of initial levels. Moreover, vitamin D helps manage comorbidities like cardiovascular health, kidney function, obesity, and immune function.

Despite living in sun-rich areas, South Asians exhibit a high prevalence of vitamin D deficiency due to factors such as darker skin pigmentation, genetic variations affecting vitamin D metabolism, and limited sun exposure from indoor lifestyles and dietary choices. This deficiency often remains asymptomatic but increases the risk of type 2 diabetes, particularly in postmenopausal women, where it is associated with higher insulin resistance and poor glycemic control. Vitamin D supplementation can improve glycemic control, reduce HbA1c levels, and help manage FPG and PPG in diabetic patients. Long-term supplementation also enhances insulin sensitivity and lipid profiles, especially in those with deficiencies. Achieving adequate vitamin D levels is essential in preventing diabetes and improving overall metabolic health. However, excessive intake can cause hypervitaminosis D, which requires careful management, including halting vitamin D intake and adjusting calcium levels to prevent serious health consequences.

SITAGLIPTIN: THE LEGACY CONTINUES

Dr HN Chakravarti, Kolkata

It is well-established that a 1% reduction in glycated hemoglobin (HbA1c) can decrease the risk of diabetes-related complications by 21%, lower the risk of myocardial infarction by 14%, and reduce diabetes-related mortality by 21%. However, effective diabetes management extends beyond focusing on A1c levels or glucose control. It should encompass a broader approach, considering factors such as cardiovascular risk and mortality when choosing oral antidiabetic drugs. Current guidelines recommend metformin, either alone or in combination with SGLT2 inhibitors or DPP-4 inhibitors, for treating diabetes. Notably, dipeptidyl peptidase-4 (DPP-4) inhibitors, such as gliptins, may be a better choice than SGLT2 inhibitors for several reasons, including:

- The use of SGLT2 inhibitors is associated with a higher risk of infections, osmotic diuresis, volume depletion, renal-related adverse effects, and increased blood ketone levels compared to placebo.
- While SGLT2 inhibitors show consistent efficacy across different races, gliptins have demonstrated significant efficacy in Asian populations.
- Additionally, some adverse effects of SGLT2 inhibitors, like volume depletion and genital mycotic infections, are more common in warm and humid conditions.

Meanwhile, findings from landmark trials have shown that: Sitagliptin has well-established efficacy and safety through various landmark trials. Adding sitagliptin to treatment regimens is an effective and well-tolerated option for patients who cannot achieve glycemic control. Sitagliptin and its combinations are particularly valuable in the Indian setting for achieving glycemic control. Sitagliptin, in combination with dapagliflozin, has shown significant benefits in Indian patients with type 2 diabetes. It provides glycemic control along with pleiotropic benefits.

APPROACH BASED ON "SUBTYPE OF T2DM"

Dr Piyush Desai, Surat

There is currently no international consensus on the subclassification of type 2 diabetes. As a result, clinical practice often distinguishes between obese and nonobese subtypes. However, the pathophysiological differences between these groups are still not fully understood.

Cluster analysis offers an alternative approach, classifying adult-onset diabetes mellitus into five clusters: severe insulin-resistant diabetes (SIRD), mild obesity-related diabetes (MOD), mild age-related diabetes (MARD), severe insulin-deficient diabetes (SIDD), and severe autoimmune diabetes (SAID).

In a study, 26.2% of Indians were diagnosed with SIDD, followed by 25.9% with MOD, 12.1% with SIRD, and 35.8% with MARD. The phenotypic characteristics of these clusters varied significantly among the Indian population, though gender and diabetes duration did not affect the stability of the clusters.

Key Points

- Compared to traditional classification, cluster-based subclassification better reflects the pathophysiology of type 2 diabetes and predicts future risk of complications and comorbidities.
- This approach may offer a more suitable tool for optimizing personalized therapeutic strategies.
- Over time, the leading causes of mortality in people with diabetes have shifted from vascular diseases to cancer and dementia, indicating the potential benefit of therapeutic strategies tailored to these emerging complications.

INDIAN DIABETES PREVENTION PROGRAM

Dr Nanditha Arun, Chennai

Lifestyle modifications can often prevent type 2 diabetes, but such interventions are usually resource-intensive. In India, primary prevention trials have demonstrated that it is possible to prevent or delay the onset of diabetes. One promising approach to delivering educational and motivational support for lifestyle changes is mobile phone messaging, which offers a cost-effective alternative to traditional methods.

Both lifestyle modification and metformin have been shown to be beneficial in diabetes prevention. A study in India that employed mobile technology for primary prevention produced significant results, highlighting the potential of this approach. The key takeaways from the Indian SMS prevention study include: (i) mobile technology's capacity to influence behavior and reduce diabetes risk, (ii) the demonstration of a clinical outcome through information technology for the first time, and (iii) the observation that early improvements in a behavior predict better long-term outcomes.

Additionally, the study revealed ethnic differences in response to mobile technology between populations in India and the UK, emphasizing the need for tailored approaches in different cultural contexts. The findings confirm that mobile phone messaging is an effective and acceptable method for delivering advice and support to individuals at high risk of developing type 2 diabetes. This approach can successfully promote lifestyle modifications necessary for diabetes prevention, especially in resource-limited settings where traditional interventions may not be feasible.

In summary, using mobile technology in diabetes management offers a scalable and impactful strategy, particularly in regions like India, where it has shown promising results.

DIFFERENT TYPES OF MILKS – UNRAVELLING THE CONFUSION

Dr Aditi Deshmane, Kolhapur

Milk has long been a dietary staple, but its various forms and impact on health, particularly for individuals with diabetes, have become confusing. Maintaining stable blood glucose levels is crucial for diabetes management, and milk's carbohydrate content, primarily lactose, can complicate this effort.

The rise in plant-based milk options, such as almond, soy, and oat, has added to the confusion. Each type varies in carbohydrates, fat, glycemic index, and overall effects on blood sugar levels. Cow's milk, often high in lactose and fat, can raise concerns about blood sugar spikes, while alternatives like almond milk are low in calories and carbohydrates but may lack protein. Meanwhile, soy milk offers a good balance of protein and fat with fewer carbohydrates. Similarly, rice milk provides less protein but double the carbohydrate compared to cow's milk.

As a result, selecting the correct type of milk is a key dietary decision for managing blood glucose levels in diabetic patients. Some of the key considerations while choosing the milk are:

- Reduce saturated fat by selecting low-fat or skim milk, or try lactose-free and plant-based options.
- Keep milk intake moderate to manage calories and carbohydrates.
- Check blood sugar after drinking milk to gauge your tolerance.
- Consult a health care professional for personalized dietary advice.
- Always read labels to ensure milk alternatives fit your dietary preferences.

MILLETS – SUPERFOOD OR HYPE

Dr Kavita Gupta, Nagpur

Millets, once considered "coarse grains", have gained prominence as crucial parts of diabetes management due to their low glycemic index and high nutritional value. These ancient grains, such as finger millet (ragi), foxtail millet, and pearl millet (bajra), help control blood sugar levels and are a rich source of other micronutrients, such as iron, calcium, etc. Thus, they are a favorable food choice for those managing diabetes.

A meta-analysis of 99 studies has shown that long-term consumption of millets significantly reduces fasting blood glucose and postprandial blood glucose levels, contributing to better glycemic control. Additionally, millets have been found to lower HbA1c levels in prediabetic individuals, reducing the risk of developing type 2 diabetes.

The following study concluded that millet is beneficial in managing and reducing the risk of developing diabetes. Hence, the authors suggested that millet can be used to design appropriate meal plans for diabetic, prediabetic, and nondiabetic individuals as a preventive approach. Despite millet being a superfood, several points should be considered, such as:

- Moderation is the key to healthy eating.
- Millets do have an extraordinary nutritional value but try to include a variety of millets in the diet to ensure the adequacy of different nutrients.
- A balanced diet should provide not more than 45% calories from cereals and millet.

OILS – WHICH ONE TO CHOOSE?

Dr Niti Desai, Mumbai

Diabetes is associated with a three- to fourfold increase in the risk of coronary heart disease. Additionally, nearly all individuals with diabetes exhibit one or more lipid abnormalities. Since fat intake provides the second-highest source of calories after carbohydrates, it is crucial to manage fat consumption in diabetes.

Some simple tips to help manage fat intake in diabetic patients:

- Limit visible fat (vegetable oil) to ½ kg per person per month.
- Consume 3-4 teaspoons of oil and 1-1½ teaspoons of ghee per day.
- Use two or more vegetable oils or blended oils.
- Nonvegetarians should consume oily fish (250 g/week).
- Vegetarians should include algae oils, walnuts, flaxseed, or chia seeds in their diet.
- Avoid using vanaspati as a cooking medium and limit processed foods containing trans fats.

SALT AND SUGAR – GETTING THE FACTS RIGHT

Dr Naaznin Husein, Mumbai

Excessive sugar and salt consumption are key contributors to global health challenges, including obesity, cardiovascular diseases, diabetes, and cognitive impairments. Processed foods and sugary beverages have drastically increased dietary sugar intake since the mid-20th century.

However, the 21st Century witnessed a moderate decline in added sugar intake. These declines in sugar were accompanied by only a minimal 1% increase in dietary facts. Despite the decline in global sugar consumption, it is still high. Sugar-sweetened beverages (SSBs) are still the main source of daily added sugar in most Western countries.

Studies have established a strong link between SSBs and adverse health outcomes, such as liver dysfunction, telomere shortening, and increased cardiometabolic risks. Reducing sugar intake, especially from SSBs, has been found to improve weight management and reduce the risk of metabolic disorders.

Similarly, excessive salt intake contributes to hypertension, autoimmune disorders, and inflammatory diseases like rheumatoid arthritis and multiple sclerosis. Reducing salt intake to below 5 g/day, as recommended by the World Health Organization (WHO), could save millions of lives annually by mitigating the risks of cardiovascular diseases and cognitive decline. Always remember the *SALT REBOOTING* Mantra

- Control excess consumption
- Alter to healthy cooking methods
- Delete high-sodium foods.

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