HCFI Dr KK Aggarwal Research Fund

Round Table Environment Expert Zoom Meeting on "Environmental Challenges in 2024 and Scope of Public participation"

December 31, 2023 (Sunday, 12 noon-1 pm)

- The choices made and action taken in the next few years will play a very critical role in deciding our future and of generations to come.
- Greenhouse gas (GHG) emissions reached a new high in 2022. In September 2023, global average temperatures were 1.8°C higher above the pre-industrial times.
- To avoid breaching the upper limit of 2°C, the GHG emissions will have to be 28% lower than the current by 2030.
- To keep the temperature below the target of 1.5°C, as per the Paris Agreement, GHG emissions need to be 42% lower by 2030.
- Decisions taken in COP 28, particularly the accelerated short-term actions and an orderly transmission away from fossil fuel will help in achieving the targets of GHG reductions.
- Our environmental concerns in 2024 will be mainly dominated by climate change. Global warming and climate change can cause other serious issues besides increase in temperature, such as rising ocean levels impacting coastal cities, dramatic climate events such as long droughts and massive flooding, extinction of certain species, etc.
- Other challenges include the increasing air pollution, especially in the Indo-Gangetic plain; waste management, especially in the urban areas; deforestation, because of land acquirement for building and other developments and depleting ground water table in many cities leading to an imminent water crisis.
- Pollution by electric vehicles is going to be another challenge because of environmental concerns around lithium mining along with issues regarding proper disposal and recycling of lithium batteries.
- The impact of electric vehicles on the grid needs to be considered.
- It needs to be explored if the electricity required for electric vehicles can be generated from renewable energy sources.
- There are gaps in public transport system with issues of time and reliability.
- Unless drastic measures are taken, vehicular pollution will not reduce.
- Although the use of electric vehicles is increasing, the shift is gradual. People are apprehensive about taking these vehicles for long distances. Infrastructure is needed for electric vehicles to become the preferred mode of travel.
- CRRI (Central Road Research Institute) is engaged in research in converting parali (stubble) to bitumen. Research is ongoing for use of plastic waste in road construction.
- India's first steel slag (industrial waste) road came up in Surat in 2022. Such roads have also been built in Arunachal Pradesh.
- Road dust is a huge problem. Proper cleaning of drains before monsoons is a must.
- The health of the river has not been given importance. It should be treated as a living being and should be provided care in a similar manner. Doing so will take care of water pollution and river pollution.
- We have to find out reasons as to why our taps do not provide safe drinking water. There are several reasons for this. Intermittent supply of water is one reason for this. Sewage flow should be channel flow; this prevents entry of dirty water in fresh water even if the supply is intermittent.
- The general public should know how to test for clean water. Orthotolidine (OT) solution water testing kit can be used. Add 2 drops in tap water, if the water turns yellow, this means that the water has chlorine and one can drink.
- Awareness will increase the confidence of public in tap water. Lot of funds are needed and not in a piecemeal manner. Rivers cannot be cleaned unless action is taken in a holistic way.
- There are lot of upcoming challenges in water supply and sewerage in the coming years. For example, the population of Delhi has grown to over 2.5 crores, while the amount of water produced has not increased beyond 900 MGD (million gallons per day). The pressure of increase population leads to exploitation of ground water.

- Government has the potential to do rain water harvesting in district parks, ridge areas, on roof tops of schools and colleges. Storm water drains can be isolated for rain water harvesting.
- Action needs to be taken against illegal industries discharging their chemical effluents in the ground, because of which the ground water becomes toxic.
- Sewerage water is another area that needs to be tackled. Delhi generates 800 MGD sewerage water and around 550 MGD is treated.
- The rest goes into ponds and lakes and thence to the river.
- There should be increase in the use of nonconventional water sources. Treated water can be used for horticulture, irrigation.
- Urban planning focuses mainly on cars. There is no effort to encourage nonmotorized traffic.
- Use of hydrogen cars will mean less environmental pollution.
- Car fitness should be emphasized rather than phasing out of cars after a certain set period of time. If the vehicle is nonpolluting, it should be allowed to run, even after the time limit. This will also reduce financial burden.
- Noise pollution has largely been ignored.
- We should move in the direction of providing solar panels on car roofs.
- The developing planning should change and become more preventive.
- Public participation is a must to tackle these challenges. Every citizen should think how many carbon credits to save and change their lifestyle.
- Public can mainly be involved in waste reduction or recycling.
- A political will to tackle these problems appears to be missing.
- The public and the government should work together to clean the rivers.
- All things have to start at the micro level, which will then grow.
- Adopting the Mission LiFE (Lifestyle For Environment) program of the Government of India can help meet most of these challenges with the help of the public.

Participants: Mr Paritosh Tyagi, Mr RS Tyagi, Mr Neeraj Tyagi, Mr Pradeep Khandelwal, Mr Rajeev Sharma, Dr Ravindra Kumar, Dr Anil Kumar

Minutes of an International Weekly Meeting on "Reversible Diabetes"

Speaker: Dr KP Chandra *MD (Internal Medicine), DFiD (CMC), FICP, FiSH, FUPDA, FRTDI, FISCM, FISMN*, Director, Dept. of Internal Medicine & Diabetes Care, Health City Vistaar Hospital, Lucknow; Director, Chandra Diabetes & Obesity Clinic, Lucknow

January 13, 2024 (Saturday, 9.30-10.30 am)

- The concept of reversal of diabetes is very important at this point of time because 100 million people in India already have diabetes and ~150 million are on the verge of getting diabetes.
- Type 2 diabetes has always been thought as an inevitably life-long disease with irreversible and progressive beta-cell damage.
- However, restoration of normal glucose metabolism within days after bariatric surgery in most people with type 2 diabetes disproves this concept. Changes in gut hormones and profound decrease in calorie intake are mechanisms that lead to this effect.
- When the disease process itself has reversed and there is no pathophysiology, this is reversal.
- Remission is defined as disappearance of signs and symptoms of a disease, but pathophysiology may still remain.
- Partial remission is having blood sugar that does not meet the classification for type 2 diabetes (fasting blood glucose [FBG] 126, postprandial plasma glucose [PPG] <200, A1c >6.5) for at least 1 year while not taking any medications to lower blood glucose.
- Complete remission is a return to normal glucose values (FBG <100, PPG <140, A1c <5.7) for at least 1 year while not taking any medications to lower blood glucose.
- Prolong remission is a return to normal glucose for at least 5 years while not taking any medications to lower blood glucose.
- When we talk of reversal of diabetes, it is important to know the pathophysiology of type 2 diabetes and how decline in beta-cell function occurs.
- There is progressive beta-cell dysfunction in type 2 diabetes and as the dysfunction continues, we keep on optimizing/intensifying treatment beginning with lifestyle modifications + oral antidiabetic drugs (OADs), then basal insulin + OADs are added. The change has to be done in typical therapeutic progression so reversal can be obtained.

- The glycemic control deteriorates over time in type 2 diabetes with progressive decline in beta-cell function regardless of the intensity of the treatment.
- Beta-cell dysfunction occurs because of several factors such as chronic hyperglycemia, glucotoxicity, hyperinsulinemia and lipotoxicity. Acting together, these factors lead to beta-cell dysfunction.
- The 6-year Da Qing Diabetes Prevention Study showed that lifestyle interventions led to 49% lower incidence of type 2 diabetes, when the intervention was done at the time of prediabetes stage.
- Another study examined the cumulative incidence of type 2 diabetes in over 3,000 patients with prediabetes for more than 4 years. The risk reduction was 58% with lifestyle intervention and 31% with metformin.
- These data question the concept that the disease is progressive. By certain interventions, the disease process can be halted.
- Metabolic dysfunction and insulin resistance leads to hyperinsulinemia, which causes increased hunger and increased chronic calorie intake. To reverse disease activity, this vicious cycle has to be stopped.
- The Twin Cycle hypothesis was given by Roy Taylor. Chronic calorie excess leads to accumulation of fat in the liver with eventual spill over into the pancreas, eventually causing metabolic inhibition of insulin secretin after meals and onset of hyperglycemia. To reverse this, fat accumulation in the liver and triglycerides have to be decreased.
- Reversing the twin cycle can effectively improve the beta-cell function.
- With weight loss, the liver fat becomes normal and there is normal insulin sensitivity.
- Fat accumulation therefore seems to be a pathway where if intervention is done, reversal can be possible.
- The DiRECT study (Diabetes Remission Clinical Trial) was an open-label trial conducted at 49 primary care practices in Scotland and England. It included patients with recently diagnosed type 2 diabetes (<6 years) and not receiving insulin.
- Results showed weight loss of ≥15 kg in 24% participants in the intervention group and none in the control group at 12 months. Diabetes remission was seen in 46% in the intervention group and just 4% in the control group. In the group with <5 kg weight loss, the remission was 7%; in 5-10 kg group, it was 34%; in 10-15 kg group, it was 57% and in >15 kg weight loss, it was 86%. Intervention at the right time with diagnosis of diabetes within 6 years with good weight loss led to remission in this study.
- The study concluded that almost half of the participants achieved remission to a non-diabetic state and were off antidiabetic drugs at 12 months. Remission of type 2 diabetes is a practical target for primary care.
- Glucagon-like peptide-1 (GLP-1) analogs have multiple positive effects on beta cells. They increase beta-cell function (homeostasis model assessment or HOMA), beta-cell glucose sensitivity (insulin secretion rate or ISR), secretory capacity and first phase insulin secretion. They reduce proinsulin:insulin ratio.
- Liraglutide has been shown to improve beta-cell function in patients with type 2 diabetes.
- In a post hoc analysis of STEP 2 trial, semaglutide 2.4 mg was seen to improve beta-cell function in patients with type 2 diabetes.
- There is published data for early intensive insulin therapy for remission of type 2 diabetes.
- If diabetes is treated intensively in the beginning itself, it helps in beta-cell preservation and insulin secretion.
- Intensive diabetes therapy helped preserve beta-cell function and insulin secretion at 3.5 years after diagnosis of type 2 diabetes.
- In a meta-analysis of 7 trials, short-term intensive insulin therapy for type 2 diabetes resulted in improvement in HOMA-B (beta-cell function) and decrease in HOMA-IR (insulin resistance). Hence, short-term intensive insulin therapy improves beta-cell function and insulin resistance and helps to achieve long-term drug-free glycemic remission.
- A study analyzing predictors of sustained drug-free diabetes remission over 48 weeks following short-term intensive insulin therapy in early type 2 diabetes found that the remission group had lower baseline A1c, better baseline beta-cell function and shorter duration of diabetes (<2 years).
- People who had diabetes for <2 years had 56% higher chances of having drug-free remission of type 2 diabetes after 48 weeks of intensive insulin therapy.
- The least probability of reversal is seen in severe insulin deficiency, while mild obesity-related diabetes and mild age-related diabetes have excellent probability of reversal.

- Very low calorie diets have emerged as a way to remission of diabetes.
- Evidence shows that early intensive insulin therapy helps in re-differentiation of beta cells and attain sustained drug-free diabetes remission.
- Early intensive insulin therapy has led to partial remission of diabetes as seen in many studies.
- Visceral fat is responsible for insulin resistance leading to hyperinsulinemia and beta-cell exhaustion resulting in progression of type 2 diabetes.
- When visceral fat is reduced, lipotoxicity in liver and pancreas decreases and there is less gluconeogenesis in the liver leading to remission of diabetes.
- In insulin resistance, the GLUT receptors do not respond appropriately and adequately to insulin. When insulin sensitivity improves, they respond better to insulin and thus inward movement of glucose in the muscle becomes more effective.
- Muscle mass is critical in absorbing the glucose we eat. With age, muscle mass is lost.
- Intermittent fasting not only reduces fat, it also increases sensitivity of glucose.
- The concept of chronomedicine is becoming very important now. When there is dyssynchrony between diurnal variation and sleep, the synchrony between various hormones gets deranged and there is increase in counter-regulatory hormones leading to diabetes. Frequent snacking among those who sleep late increases calorie intake and then to diabetes. Night owls have a higher incidence of obesity, hypertension and diabetes compared to early birds.
- Remission of type 2 diabetes seems a possible option in appropriate populations. Type 1 diabetes is not reversible.
- Appropriate lifestyle modification with early intensive treatment in obesity-related diabetes and duration of diabetes <6 years, may reverse beta-cell dysfunction.
- Even reversal of diabetes is possible, if prolonged remission is seen in such cases.

Participants: Dr Yeh Woei Chong, Singapore, Chair of Council-CMAAO; Dr Wasiq Qazi, Pakistan, Immediate Past President-CMAAO; Dr Akhtar Hussain, South Africa; Dr Prakash Budhathoki, Nepal

Invitees: Dr Monica Vasudev, USA; Dr Mulazim Hussain Bukhari, Pakistan; Dr Azizan Abdul Aziz; Dr P Lata Anand; Dr Shashi Khanna; Dr Ashok Nathwani; Dr Tejveer Singh Chauhan; Dr Upendra Mehta; Dr Arun Kapoor; Dr Meena Bajaj; Dr Vishwanathan S Iyer; Dr Anurag Mathur; Dr KiranVinayek; Dr Poonam Chablani; Dr Abhay Jain; Dr Vishnu Bhutia; Adv Sonia Madan; Dr Sanchita Sharma, Editor-IJCP Group

Moderator: Mr Saurabh Aggarwal

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Overuse of Antifungal Creams Linked to Rise in Drug-resistant Infections

Excessive prescription of antifungal creams is contributing to the emergence of drug-resistant infections, warned a study led by Dr Jeremy Gold, US Centers for Disease Control and Prevention (CDC). Published in the CDC's *Morbidity and Mortality Weekly Report*, the research highlighted a concerning increase in severe antimicrobial-resistant superficial fungal infections, particularly drug-resistant forms of ringworm. Significant outbreaks of drug-resistant ringworms in Southeast Asia, unresponsive to standard treatments, have raised alarm. He noted that patients are experiencing extensive lesions and delayed diagnoses, emphasizing the need for caution in prescribing these medications.

The study revealed primary care doctors as major contributors to the overprescription issue, with dermatologists and podiatrists showing higher rates of prescriptions per doctor. Misdiagnosis based solely on visual inspection is identified as a significant problem, with confirmatory diagnostic testing seldom conducted.

A small percentage of physicians are responsible for a substantial proportion of antifungal prescriptions, with 10% of prescribers accounting for nearly half of these medications in 2021. The study may need to pay more attention to the problem, as many antifungals are available over the counter without a prescription. Of particular concern is the extensive use of clotrimazole-betamethasone, a combination of a steroid and an antifungal, linked to drug-resistant ringworm and potential skin damage.

(*Source: https://www.punjabnewsexpress.com/health/news/overuse-of-antifungal-skin-meds-driving-drug-resistant-disease-study-236388*)