Genetic, Social, Cultural, and economic drivers of obesity and Type2 diabetes in Indian population

Obesity and Type2 diabetes are fast-growing epidemics amongst the Indian population. India currently is called the diabetes capital of the world. Several genetic, social, cultural, and economic factors have contributed to the fast-expanding epidemics of obesity and Type2 diabetes in India.

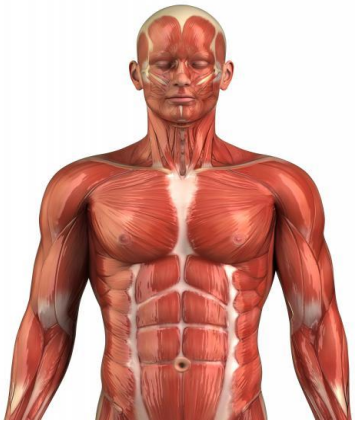
!. Genetic or biologic factors -Compared to the white race in general, the Indian population get Type2 diabetes and heart disease at a much lower level of overweight and obesity. There are two reasons for this disparity:

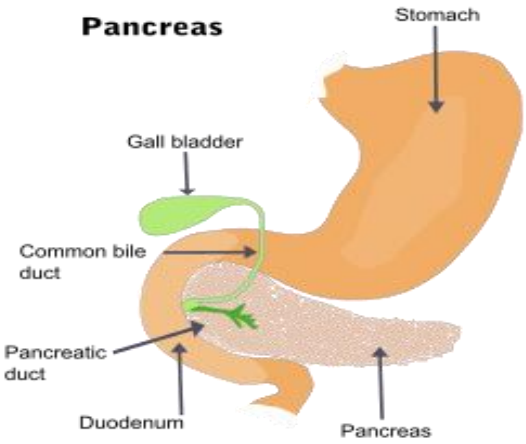
- Indians have genetically smaller muscle mass with a relatively higher proportion of fat. Since the muscles use 70-80% of consumed glucose (from sugars/carbohydrates in foods) as energy, Indian populations have a lower capacity to use up an excess of glucose. The excess of glucose not used for muscle activity gets converted into reserve fat energy. The sedentary lifestyles of physical inactivity have been significant contributors to obesity, Type2 diabetes, and heart diseases.
- Genetically Indians have a smaller number of Insulin-producing beta cells in the pancreas gland. That also puts them at a disadvantage of relatively lower levels of Insulin. Since Insulin is the essential glucose utilization hormone, less of it means a smaller capacity for handling excess sugar in the diets.

The above genetic variations subject the Indians (as well as other Asians) to a higher risk for glucose intolerance and developing an abnormality called Insulin resistance. The phenomenon of insulin resistance is at the root of many diseases such as Metabolic syndrome, PCOS, Type2 diabetes, high blood pressure, and heart disease. Keeping these genetic variabilities in mind, the Ministry of Health and family welfare in conjunction with the Diabetes Foundation of India have revised the diagnostic criteria for healthy BMI for Indians. In the revised" Consensus guidelines on the Prevention and Management of Obesity and Metabolic Syndrome. "the revised criteria for average Body Mass Index (BMI)for the Indian population is 23. The internationally accepted number for healthy average BMI is 25.

Why ↑ Risk of Diabetes – Indian population

(Less Muscle Mass and Lower Number of Insulin Producing Cells in Pancreas Gland)





Ideal Body Weight and Waistline

Overweight and Obesity calculation -Overweight is considered to be present when the bodyweight is 20% higher the perfect body weight, and obesity is considered to be present when the bodyweight is 50% above the ideal body weight.

A simple calculation for ideal body weight is:

Male: Ideal body weight =Height in centimeters -100 (weight in Kg)
Female Ideal body weight = Height in centimeter- 105 (weight in Kg)

The formula for BMI calculation is Weight in Kg/ height in meter square (you can calculate the BMI on Google using this formula called BMI calculator).

Abdominal-Obesity- A waist circumference which is more significant than average carries a far higher risk of Type 2 diabetes, Metabolic syndrome, High blood pressure, and Heart disease. When compared to overall obesity, abdominal obesity carries a higher risk of all these food and lifestyle diseases.

(Measure waist at narrowest point at the umblicus)

Ideal waistline

Half the Height in inches – 2 inches

OR

Half the Height in Centimeters (cm) – 5 Cm

(The perfect waistline measurement for a 5 foot 10 inches tall person should be 33 inches. A waistline over 35 inches will be borderline. But yes, waistline over 37-38 inches will increase the risk of food and lifestyle diseases listed above.)

2. Social and Cultural drivers of obesity and Type2 diabetes --Cultural traditions and social influence the diets as well as eating behaviors. The food is a celebratory tradition in all global cultures. In the more affluent modern urban India, food celebration has evolved into a whole new dimension of overconsumption. Good examples are:

- Expectations of the hosts and guests on over providing rich foods and drinks at all hours of the day during social visits. No one must leave without putting some food in the mouth irrespective of the time of the day or the condition of the stomach full or empty. There is always room for a snack and dessert.
- Weddings and celebrations become an ungodly display of wealth, and food indulgences, where the overconsumption of unhealthy foods is the rule.
- Junk food celebrations for Children –For affluent families in cities, the preferred venues for birthday and graduation celebrations have become fast food joints where the children have free access to junk foods and sugary beverages. That promotes the culture amongst impressionable young children that junk food and sugary drinks are reward items duly approved by the parents. There is no surprise that overweight and obesity currently is an epidemic affecting 30% of affluent city children. These children grow up with the social acceptance of junk, fast foods, and sugary drinks.
- Pervasive late-night eating behavior of business and corporate communities- During daylight hours, the body is physically active and requires energy. Insulin is the hormone which makes energy from glucose. Since the energy needs of the body are higher during the day, the body stays more sensitive to Insulin. Therefore, the glucose absorbed from the digestive tract is effectively used up in making the energy for activity during the daylight hours. At night the body is inactive and becomes Insulin resistant. The glucose absorbed from the digestive tract at night is not needed to make energy for the activity. The unused glucose, therefore, gets converted to reserve energy fat. Late-night eating after 8 PM, for this reason, would lead to weight gain even if one eats the most holistic, healthy meals.
- The tradition of eating multiple meals and snacks –Before the 1970s most global populations ate 2-3 meals per day, primarily during daylight hours. The time intervals between meals were long 6-7 hours and that between night meal and next morning meal over 10-12 hours. The glucose absorbed from the digestive tract following a meal provides an energy source for 2-3 hours. After this body must fall back on its stored reserve energy source of glycogen and stored fat. Frequent eating keeps body glucose levels high most hours of the day going into late at night. That prevents the body from tapping into its fat reserve energy. Multiple meals going late into the night is one of the most important reasons for modern Indian epidemics overweight and obesity, Type2 diabetes, and other related food and lifestyle diseases. The famous slogan by Doctor Jagannath Dixit (designated ambassador of diabetes prevention by Maharashtra state) make a good sense:

दिन में खाएं एक बार तो बने योगी,
खाएं दो बार तो बने भागी,
और खाएं तीन बार तो बने रोगी

3. The economic drivers of Obesity and Type2 diabetes –The Growth in the financial sector has lifted millions out of poverty into the middle class increasing the purchasing power for foods and amenities. Globalization of the food chain has brought easy access and affordability of junk foods, pre-prepared packaged foods, and sugary beverages. Western and Indian fast food joints sit at every corner in the Indian city streets. Soft drinks and fruit juices rich in fructose sugar are replacing water as the beverages of choice. Since the population is unaware of the harmful health effects, the fast-food and drink industry continues to grow exponentially in India with each passing year. The only way to stop these social trends is Public education on healthy foods starting at schools and community level.

- At the global level, the financial success of the commercial food and beverage industry has run in parallel with the colossal economic market failure for the nations concerning healthcare costs. That unsustainable status quo must change. Santayana's timeless prophecy states, "Those who do not remember the lessons of history are condemned to repeat it." The commercial food and beverage industry are running on the similar reckless footsteps as the tobacco industry and will eventually meet the same fate as did the big tobacco in the 70s and 80s.

- Long work hours which are disruptive to healthy eating and sleeping behaviors- The culture of working ungodly long hours for generating more profits for corporations at the expense of employee health is another excellent example of short-sighted financial success which leads to overall economic market failure because of poor employee health. The foreign multinationals have led the way in this regards, creating a culture of 24/7 heroic glorified slavery. In the long run, overworked young employees, their families, and society lose out because of the disease burden of obesity, Type 2 diabetes and Heart disease-induced disability, and high healthcare costs.

- Physical inactivity from automation, automobile, and perpetual digital connectivity to screens and cellphones - The mode of transport to work influences the prevalence rate of obesity:

    - ❖ Private door to door transport via automobile- Obesity prevalence 50%
    - ❖ Public transportation (some walking involved)-Obesity prevalence 37%
    - ❖ Bicycle riding and walking to work— Obesity 24%

  Taking above figures into consideration, United Kingdom Health department proposed that train and bus riders get off 1-2 mile distance away from worksite to ensure reasonable physical activity. The economic drivers are fast permeating the rural sectors in India. Between the years 1989-2010, the prevalence of obesity in the rural population in India rose nine-fold from 2-17%. It is expected to grow faster as the automation and commercial food and beverage markets permeate into the rural areas.

4. Reduced sleep and obesity risk - Several scientific studies have demonstrated that the sleep deficit of as little as 1-2 hours per day, can cause weight gain of as much as 10-15 kg. Medical science has robust data to prove that obesity and lack of sleep are interacting epidemics. Protecting sleep time is a challenge in modern times where the life of the human is dominated by artificial light, disrupting blue light from digital and television screens, social jet leg of late-night parties, and ungodly work hours imposed by the competitive big corporate jobs.

There are two kinds of sleep in humans:

- Natural rejuvenating hormonal sleep, which requires the brain hormone Melatonin.
- The deficit or catch-up sleep – That is the strong urge to sleep when the body gets tired from day's work. For every one hour of daily activity, 20—30 minutes of deficit sleep get added. The total adds up to 7-8 hours of sleep for an average human who is awake for 16 hours of the day.

No human dies because of lack of sleep because the deficit sleep comes to the rescue. Unfortunately, deficit sleep is interrupted sleep and not rejuvenating. Sleep hormone Melatonin is a vital hormone for rejuvenating sleep. The Pineal gland in the brain synthesizes Melatonin on exposure to sunlight or bright morning light. Melatonin remains stored in the Pineal gland from where it is released when there is the darkness of the evening. Logically, the melatonin synthesis will be suboptimal in the late risers, and its release inhibited in the evening when eyes get exposed to bright artificial light and blue light from the televisions, cell phones, and the digital screens. When one travels through time zones, the sleep gets disturbed because of disruption in melatonin synthesis and release. The medication of choice for jet lag insomnia is melatonin.

Lack of rejuvenating sleep leads to the release of stress hormones such as Cortisol and epinephrine in the body. The cortisol hormone causes abdominal obesity, high blood sugars, high cholesterol, and muscle atrophy. High epinephrine levels cause anxiety, mental anguish, high blood pressure, and fast heart rate. The mindset of living off on 3-4 hours of sleep as a badge of honor for hard work is not a good idea, because chronic lack of sleep comes with a high risk for unexpected heart attacks and stroke.