



**Does sugar cause diseases like  
diabetes & dental caries??**

**ABINASH VERMA**

# Non-communicable diseases being associated with sugar

2

- Diabetes
- Dental Caries
- Cardiovascular diseases
- Hypertension & Blood pressure
- Cancer etc.

# Diabetes: As per International Diabetes Federation

3

- What is Diabetes?
  - When the pancreas is no longer able to make insulin, or
  - When the body cannot make good use of the insulin it produces.
- And why is insulin important?
  - All carbohydrate foods are broken down into glucose in the blood.
  - Insulin helps let glucose pass from the blood stream into the cells in the body to produce energy.

# So, can we say sugar causes diabetes???

4

- Not being able to produce insulin or use it effectively leads to raised glucose levels in the blood

- So, what we need to understand is:

**Whether sugar consumption affects the pancreas from producing insulin?**

- I personally do not think so.

# Diabetes in India....

5

- Diabetes is said to be a growing challenge in India with estimated 8.8% diabetic population, in the age group of 20 and 70 years.
  - Total adult population :829,491,000
  - Prevalence of diabetes in adults :8.8%
  - Total cases of diabetes in adults :72,946,400
- In 2000, 31.7 million were said to be diabetic
  - Said to have risen to 63 million in 2016 (almost 100%).

# Sugar consumption in 2000 and 2016 .....

6

| Year   | Domestic consumption | Indian population | Per capita consumption |
|--------|----------------------|-------------------|------------------------|
| 2000   | 16.1 mn tons         | 1053 mn           | 15.3                   |
| 2016   | 24.5 mn tons         | 1324 mn           | 18.5                   |
| Growth | 52 %                 | 25.7 %            | 20.9 %                 |

- Growth of diabetes in India from 2000-2016 has been @100% or around 6.25% per annum (simple average)
- As compared to that, Sugar consumption per person per year has grown @21% or around 1.3% per annum (simple average)

# Dental Caries

7

- Dental caries is a medical term for tooth decay or cavities.
- For simple understanding, dental caries occurs when bacteria living in our mouth make acid, which then begins to eat away at our teeth or erodes the tooth enamel.
- Along with the saliva and food particles, the bacteria accumulate on the surface of the teeth in a sticky film called plaque.
  - The plaque forms easily in cracks, pits or fissures in the back teeth, between teeth and near the gum line.

# Acid in the villain

8

- The villain when it comes to our teeth is plaque, and plaque's evil minion is acid.
- If the food itself is acidic, no bacteria is needed to metabolise foods to form a plaque.
- We can therefore, protect our teeth by:
  - Reducing our intake of acidic foods and /or
  - Not allowing the foods or acids too much time to form a plaque on our teeth.



# Sugar has a pH value of .....

9

- Citrus fruits, lemons, pickles, grains, tomatoes, coffee, processed foods, high protein foods, sodas, fresh & processed meats etc. are acidic.
  - Lemon juice has a very low pH of 2 to 2.35
  - Tomatoes have pH of 4.30 to 4.90.
- Unfortunately, some fruits like blue plums (pH 2.80-3.40), grapes (pH 2.90-3.82), pomegranates (pH 2.93 - 3.20) and even apples and mangoes, having pH of below 4.80, are acidic.

# Sugar has a pH value of 7

10

- Sugar like water is neutral
  - And itself cannot harm our teeth or the enamel
- However, there is a second aspect to the whole story
  - Whether the ‘bad’ bacteria needs only sugar to form acids/plaque. Is the evil minion for the bacteria only sugar
  - Or are there other factors?
- To metabolise any food, the bacteria requires adequate time.
  - Therefore, the faster a food is removed, the less chance it will have to feed the bacteria.

# Sticky foods !!!!

11

- Sticky foods, which don't get easily washed away, either naturally with saliva or with the water we drink, give more time to the bacteria to metabolise them into acid
  - Potato starch in potato chips cling longer to the teeth than many sugar foods, like chocolate bars (New York University Dental Care)
- Tooth decay also related to frequency of eating
  - Than to the amount of starch or sugar etc.
  - Frequent snacking hurts teeth, because it reintroduces food particles and keeps a thin layer on the teeth all day, enabling plaque buildup

# So, what do we think about dental caries

12

- Sugar is not acidic: cannot directly harm our teeth on its own.
- The ‘bad’ bacteria form acid/plaque by feeding on and metabolising several foods, and not only sugar.
- Sticky foods are more dangerous and too much snacking, not giving time between meals for the saliva or water to wash away the acid or plaque, are more dangerous.
- Regular cleansing and washing, including brushing and flossing will check all teeth decay, and allow us to eat anything we want.

# WHO recommendation

13

- WHO has recommended that not more than 10% energy should come from sugar
  - That translates into roughly 50 grams of sugar for a person of normal weight
- The question that needs to be asked is how these numbers have been derived by WHO
- Also, whether there is any scientific evidence or any conclusive research which confirms or even suggests that sugar consumption leads to any disease??
  - At least, we have not found any

## What does WHO say:

14

- Rising prevalence of diabetes & other non-communicable diseases is driven by a combination of factors –
  - Rapid urbanization, sedentary lifestyles, unhealthy diets, tobacco use, and increasing life expectancy.
  - Obesity and overweight are the most important risk factors responsible for diabetes.
  - Much of the diabetes burden can be prevented or delayed by behavioural changes favouring a healthy diet and regular physical activity.

# WORLD PER CAPITA CONSUMPTION OF SUGAR (in kg)

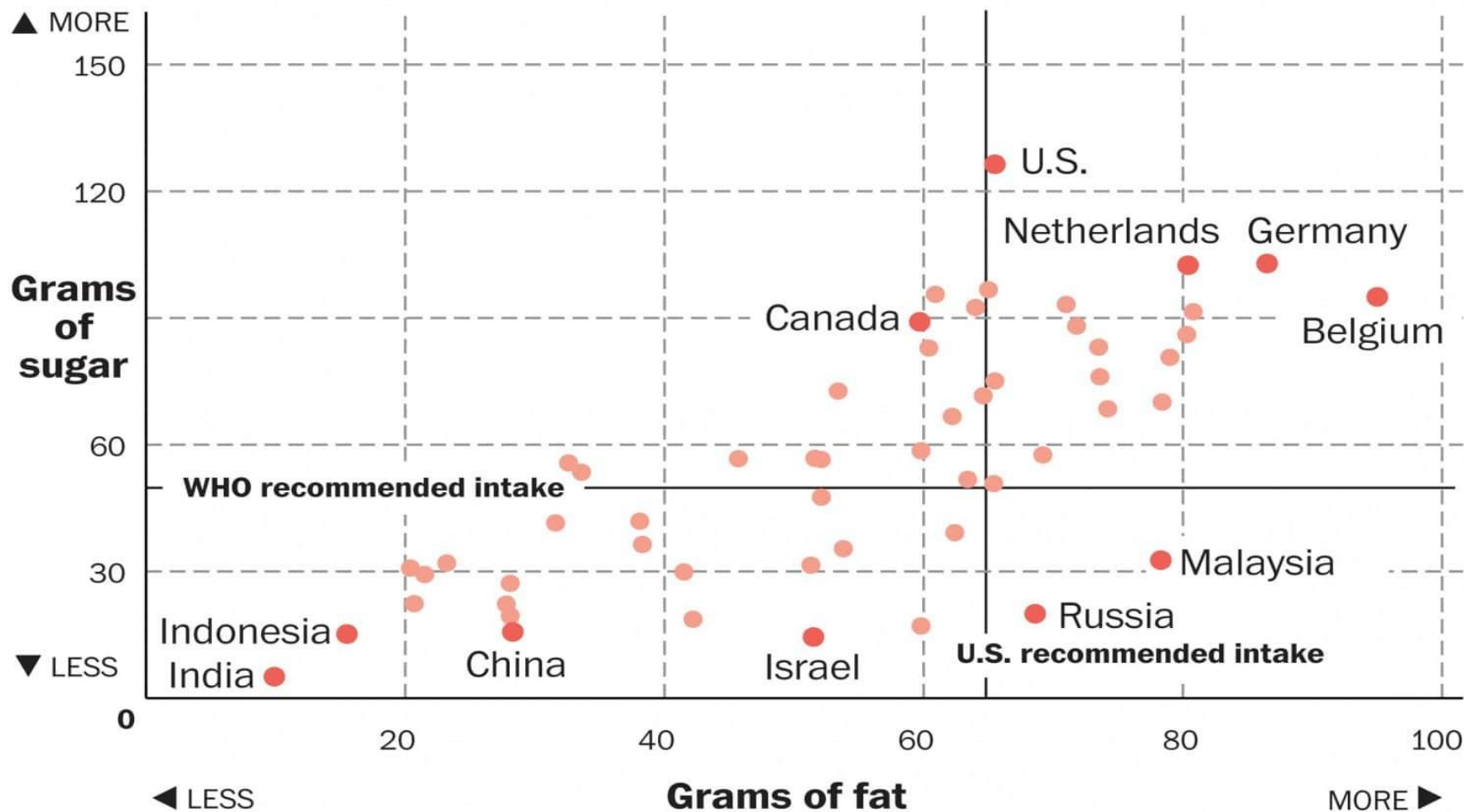
15

| Countries   | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| USA         | 30.4 | 29.4 | 30.8 | 31.1 | 30.8 | 30.4 | 29.5 | 31.5 | 31.8 | 30.8 |
| Russia      | 39.8 | 39.2 | 39.3 | 39.3 | 39.3 | 39.3 | 36.9 | 37.5 | 38.8 | 39.5 |
| Brazil      | 60.7 | 58.8 | 63.8 | 62.0 | 59.6 | 59.0 | 54.5 | 53.9 | 53.9 | 52.6 |
| India       | 19   | 19.1 | 18.1 | 16.5 | 18.1 | 17.9 | 18.6 | 19.8 | 18.8 | 18.4 |
| Japan       | 16.2 | 16.8 | 17.5 | 17.3 | 17.3 | 17.1 | 17.0 | 16.4 | 16.5 | 16.6 |
| Bangladesh  | 8.4  | 9    | 9.6  | 10.0 | 10.6 | 11.2 | 11.6 | 12.0 | 12.5 | 13.0 |
| Pakistan    | 25.7 | 25.8 | 25.8 | 25.2 | 25.3 | 25.4 | 25.5 | 25.7 | 25.3 | 25.7 |
| Thailand    | 32.2 | 34.1 | 36.6 | 38.1 | 39.6 | 42.0 | 43.1 | 42.7 | 44.4 | 44.2 |
| Sri Lanka   | 30   | 30.4 | 30.3 | 31.0 | 31.1 | 31.6 | 31.8 | 32.1 | 32.2 | 32.2 |
| Australia   | 52.5 | 47.1 | 46.5 | 45.3 | 46.1 | 44.7 | 46.9 | 54.7 | 35.3 | 37.7 |
| New Zealand | 50.4 | 49.8 | 49.2 | 48.7 | 48.1 | 47.6 | 48.2 | 47.7 | 47.2 | 46.7 |
| Singapore   | 58.1 | 55.3 | 54.4 | 52.4 | 51.4 | 50.9 | 50.5 | 49.7 | 48.0 | 47.3 |

Source: ISO

# Where people eat the most sugar and fat

Daily fat and sugar consumption



Source: Euromonitor

WAPO.ST/WONKBLOG



# Indian scenario

17

- At about 19 kilos of per capita consumption of sugar in India, the per day consumption works out to around 52 grams
- Does that raise any concern or establishes any correlation that diabetes or other non-communicable disease can or has been caused by sugar consumption in India??
- If not, we should be careful about simply copying something from another country and unnecessarily worrying people
  - Or making them believe that if they reduce sugar consumption, all their health problems will be solved
  - Whereas the problem lies somewhere else

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**Thank you**

[dgisma@indiansugar.com](mailto:dgisma@indiansugar.com)