Team Name – Decoding Cancer

Title - Obesity and Breast Cancer

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Age Group - 10-12 years

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Abstract

Background: Obesity plays a significant role in the establishment and progression of Cancer.

Aim: To learn the cause, understand the risk factors and analyze the interrelation of obesity & cancer

Methods:

➢ Website References, weekly meeting, research, collaboration and collating the accurate and credible information

Discussion:

➢ How an unhealthy lifestyle develops obesity which can cause cancer

Conclusion:

➢ Certain compounds of unhealthy food can be carcinogenic therefore choice of food is important and living healthy lifestyle and avoid being Obese is key to avoid cancer

Cancer occurrence

In 2017, 277,000 people had cancer in NC and by end of year 2019 it is projected to have 62,466 new Cancer patients[1]

What is obesity

Obesity is a medical condition that occurs when a person carries excess weight or body fat that might affect their health.[2]

Adults : For adults, WHO defines overweight and obesity as follows: overweight is a Body Mass Index (BMI) greater than or equal to 25; and

obesity is a BMI greater than or equal to 30.

Children- A sign of childhood obesity is a weight well above the average for a child's height and age[3]

Foods that trigger Obesity [4]

1. Sugar

2. Saturated Fats

3. Trans Fats

4. Omega 6 fatty acids

5. Refined carbohydrates

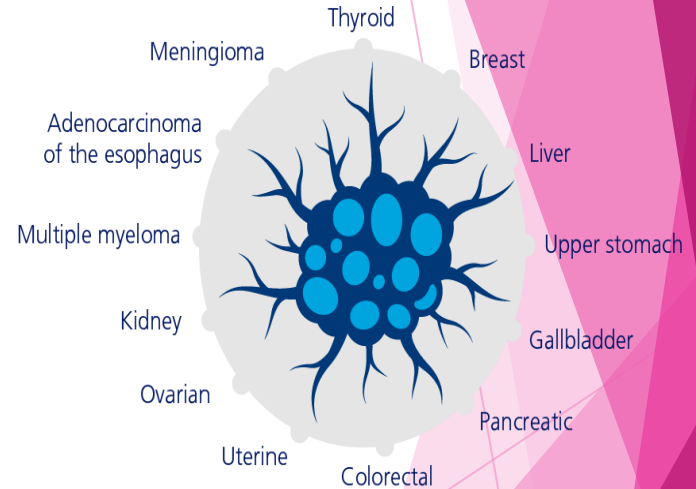# The Right Food Choices to Avoid Obesity and Cancer[5]

1. Turmeric and Ginger
2. Onions and Garlic
3. Fatty fish
4. Whole grains
5. Dark leafy greens
6. Nuts
7. Peppers
8. Tomatoes
9. Olive oil
10. Beets, Green Tea, Berries, and Sweet Potato

How Obesity is related to Cancer

➢ **When a person is obese, they can risk to damage the immune system, which can lead to the cells to not die out.**

➢ **A damaged immune system can cause the production of too many abnormal cells which can lead to cancer.**

➢ **Obesity also increases risk for second primaries and predicts worse prognosis in several types of cancer including those of breast, esophagus, colon, prostate, kidney, ovary, uterus, liver, tongue and others.**

➢ **Obesity can lead to hormonal imbalances in the body which can lead to breast cancer as well.[6]**

13 cancers associated with excess weight and obesity[6]

Thyroid

Meningioma

Breast

Adenocarcinoma of the esophagus

Liver

Multiple myeloma

Upper stomach

Kidney

Gallbladder

Ovarian

Pancreatic

Uterine

Colorectal

[7]

How obesity is related to Breast Cancer

➢ **Obesity has been associated with higher breast cancer risk across observational studies, meta-analyses, and systematic reviews in different populations, especially for estrogen receptor positive Breast cancer in postmenopausal women.**

➢ **Breast cancer in overweight/obese postmenopausal women has been attributed, in part, to increased estrogen production as a consequence of hyperadiposity. [8]**

➢ **Diabetes , which is very common among obese people also has a direct link with several types of cancer including Breast cancer. High levels of increased circulating Insulin in the body are associated with increased BMI and can contribute to cancer directly and indirectly including Breast Malignancies .[9]**

Obesity and Breast Cancer: Role of Inflammation and Aromatase

Inflammation[10]
➢ **Inflammation promotes tumor growth and different cancers**
➢ **Obesity causes breast and systemic inflammation**
➢ **This inflammation contributes to the development and progression of breast cancer**

Aromatase[11]
➢ **Enzyme in the breast responsible for estrogen synthesis and production**
➢ **Obesity increases breast tissue leading to increase in aromatase**
➢ **Aromatase activity in the breast tissue may promote the growth of tumors**

Inflammation: The Emerging Link Between Obesity and Cancer

- ➢ **Inflammation is a complex system in our bodies with an ever-growing list of identified components[12]**
- ➢ **Powerful evidence in support of the relationship of breast inflammation and aromatase expression has come from a series of studies by the group of Dannenberg at Weill Cornell Medical College and Memorial Sloan Kettering.[13]**
- ➢ **Inflammation has emerged as a leading player in cancer biology.[14]**
- ➢ **Obesity provides a direct link between inflammation and dysregulated metabolism and not surprisingly therefore has an emergent role in the development of numerous cancers.[15]**

Obesity as a Global Health Problem[16]

➢ **Obesity is one of today's biggest health problems**

➢ **Obesity affects all ages and social classes**

➢ **It is associated with many diseases such as diabetes, hypertension as well as many types of cancers**

➢ **In women, obesity leads to inflammation and a suppressed immune system which make them more prone to breast cancer. Men are also prone to breast cancer**

➢ **Obesity is increasing in both the developed and developing countries**

Top 10 countries/islands with highest obesity rate [17]

Flag	Name	Obesity Rate ▾	BMI	Population 2019	Area
	American Samoa	74.60%	34.9	55,312	199 km²
	Tokelau	74.40%		1,340	12 km²
	Nauru	61.00%	32.5	10,756	21 km²
	Cook Islands	55.90%	33	17,548	236 km²
	Palau	55.30%	29.4	18,008	459 km²
	Marshall Islands	52.90%	29.2	58,791	181 km²
	Tuvalu	51.60%	29.3	11,646	26 km²
	Niue	50.00%		1,615	260 km²
	Tonga	48.20%	31.9	104,494	747 km²
	Samoa	47.30%	31.7	197,097	2,842 km²

Cancer & Obesity Ratio Across the World[18]

Key Causes of Cancers
- smoking, diet, obesity, and alcohol intake

Prevalence of cancer ranges
- Between 0.4% to 5.5% of population
- In 2017 - 100million(M) people were affected
- In 1990 – 45 M people were affected

Type of cancers globally from high to low
- Breast cancer (17 M populations)
- Prostate (10 M populations)
- Colon & rectum (9 M populations)
- Cervical, tracheal, bronchus & lung, and uterine (3 M populations)

Key Facts of Obesity
- USA, 12th Highest in Obesity
- In Mexico obesity is
  - 16.7% in preschool children
  - 26.2% in school children
  - 30.9% in adolescents
- 28.1% of adults are Obese in UK
- 60% of Australian adults are obese and almost 10% are severely obese
- 70% of population are obese in Qatar

Mortality Rate with Obesity Across The World[19]

➢ **Obesity is associated with an increased rate of disease and death, particularly from Cardiovascular diseases and Cancer. According to the National Institute of Health,in the United States,an estimated 300,000 deaths per year are due to the Obesity epidemic.**

➢ **In 2015, 5 % of children overall were obese, and 12 percent of adults. Since 1980, obesity has doubled in more than 70 countries.**

➢ **Hispanic (47%) and Non-Hispanic blacks (46.8%) has the highest age adjusted prevalence of Obesity, followed by Non-Hispanic Whites (37.9%) and Non-Hispanic Asians (12.7 %)**

➢ **More than half of the European population is overweight and up to 30% is obese with prevalence worldwide doubling since 1980 [World Health Organization (WHO) 2011].**

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Thank You