Nutrition and Childhood Obesity

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Abstract
Obesity is very appropriately defined as the Body Mass Index (BMI) above 30Kgs/m$^2$ on an average. No doubt, one of the important factors for it is the genetic or hereditary factor. However, nutrition does play an important role too. Any person who has a eating habit which is not a balanced diet can tend to become obese. Many people feel that by having a reduced diet, one can maintain the BMI below 30 often lands up in being obese. Of course it is needless to point out that, those who crave for food; especially the so called “junk foods” are invariably obese. Therefore, it is always advised that along with a balanced diet, one must have a minimum amount of exertion to burn those extra calories too. In the present day living pattern, where most of us have a sedentary life, there should be some room for exercise.

Introduction
Obesity is a physiological condition when excess of fat accumulation in different parts of the body hindering the normal physiological processes of the body. A person is said to be obese when the BMI (the weight of the body in Kg, is divided by the square of the height in meters) exceeds 30Kgs/m$^2$. Some People put it at a lower value of less than 25Kgs/m$^2$. Obesity is the cause of many diseases like when body fat is being stored in muscles, then insulin cannot store the excess of glucose (in the form of glycogen) there, resulting in high glucose level in the plasma a symptom similar to diabetes. This high level of glucose can be highly injurious to the neurons in the brain along with certain other parts of the body like heart. Fat deposition over the heart can also lead to development of cardio-respiratory arrest. When the fat deposits are heavy in the waist, then the load of the body will be in the hip and knee joints leading to degeneration of the cartilaginous tissue, leading to arthritis in old age.

Etiology
Genetic factor

Genes can directly cause obesity in disorders such as Bardet-Biedl syndrome and Prader-Willi syndrome. It has been observed that getting the most abundant favorite food followed by least exercise lead to obesity and this is not by one gene but multiple genes. However, one can still prevent obesity by following a highly disciplined regime of diet and exercise. Obesity risk is much higher for a person with a family history as opposed to a person with no family history of obesity, and an even higher risk is observed in cases of severe obesity. It has also been observed that phenotypic characteristics like abundance of adipose tissue is responsible for nearly 50% of obesogenic conditions, whereas, mere quantity of body fat makes only 5-30% of obesity [1].

Weight gain and adiposity increase with age, an effect also influenced by heredity. It has been observed that the genetic factor along with the right type of environment will invariably result in developing obesity that is such individuals will invariably store fat in their muscles.

Imbalanced nutrition / diet

Dietary energy density (DED) is the ratio of energy (kilocalories or kilojoules) intake to food weight (grams) and is a measure of diet quality. Consumption of foods that are rich in DED often results in development of obesity in adults as indicated by high BMI [2]. Such a pattern is observed mostly in women and sometime in men also.

Childhood obesity

The food that is given to the child is very important for its growth and development and it is often a key factor in maintaining the right body weight as per its activity [3]. However it has been observed that this important fact is often neglected and about one tenth of school going children are obese [4]. Such an observation is prominently seen in developed nations rather than in developing nations where dietary imbalance is the main cause for energy imbalance. The trend however is on the rise in many developing nations too.
The role of food in obesity development is not very clear. It is believed that the child should be given food which will meet its energy requirement for basal metabolism, growth and its physical activities. This will, to a large extent, control development of obesity. This dietary requirement is mainly based on gender, age and the related physical exertion. If the child is provided with more energy, obviously it would be responsible for the high mean body weight [7]. However if the child is provided lesser energy than its requirement, then of course it would result in malnutrition.

The key dietary components that should be considered for development of obesity in children include: protein intake, carotenoids and fatty substances. These are mostly used as biomarkers and serves as indicators for developments of obesity [8-12].

Cognitive factors include lower literacy skills, limited attention span, concept of time, memory, knowledge of food, food preparation methods and lack of familiarity with recipe components [13,14].

Conclusion

The most important consequences of obesity among children are development of different diseases [15] like 60% of obese children between the age group of 5 to 10 years have some or the other risk factors of cardiovascular diseases [16]. When some of these BMI were tracked into adulthood, it was found that many of the adults developing from obese children carried carotid intima-media thickness, a marker of generalized atherosclerosis [17]. Some of these obese children when grew into adolescents showed symptoms of type 2 diabetes, type 1 diabetes and certain cancers.

It is therefore, essential for parents to monitor the energy intake mostly through different food and help to prevent development of obese children as well as malnourished children too. This does not mean that the parents or other elders should militarize the food intake of the child by not giving any room for them to have their favorites at all. It simply means that whatever the child eats must follow some rules of balanced diet and exercise.

Later on when the child steps into adolescents (from the age of 12 years or so) and then into adulthood, such monitoring of their dietary intake, would become more and more difficult thus ultimately predisposing them to many of the consequential diseases.

References
