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Global consequence of malnutrition and its preventive methodologies

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Abstract
The term 'malnutrition' is now a days a major concern all over the world. Malnutrition basically results from eating diet consisting of either insufficient nutrients or excess nutrients, which as a result creates major health problems. For example, malnutrition often results muscular dysfunction, weakness, altered metabolism. It also affects the immunity system, resulting in an increased risk of infection. This paper briefly describes the various symptoms of malnutrition, its impact on children all over the world. It also describes the co-relation with feeding habit. And finally, it conveys a common message how to keep away this disorder and make ourselves physically and mentally healthy.

Keywords: malnutrition, insufficient nutrients, muscular dysfunction, weakness, altered metabolism

1. Introduction

The world Health Organization defines malnutrition as "The cellular imbalance between the supply of nutrition and energy and the body's demand for them to ensure growth, maintenance and specific function" The term 'Protein-Energy malnutrition' (PEM) applies to a group of related disorders that includes Marasmus, Kwashiorkor and intermediate states of marasmik-kwashiorkor. The term Marasmus is derived from Greek word Marasmus, which results significant waste of fats, muscles and tissues of the body. Marasmus involves inadequate intake of Protein and calories and is characterized by emaciation. Malnutrition is a complex topic that affects different communities and different populations in a variety of ways. Given its many faces, adequate data to address this serious condition is essential if solutions are to be found.

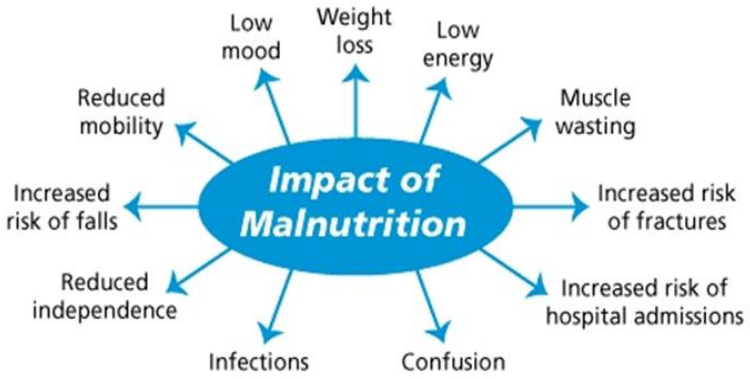

Fig 1: Impact of Malnutrition

Defining exactly what malnutrition is has also been a challenge. However, there is agreement that malnutrition is an issue of critical importance around the globe. This population brings together important research article previously published in Science with original articles, all from top researchers and thought leaders in the field.

For its sustenance on the earth, every living organism requires food, which is quite essential for carrying out its physical and mental activities, growth and development. Man requires some specific nutrients for their growth and development, these are Carbohydrates, Proteins, Fats, Vitamins, Minerals, Roughage and water in right proportion and sufficient quantity, which he gets through the food he eats. The food, which proves all these essential nutrients in proper amount, it is called balanced diet. The deficiency or even excess of any of these in persons diet results into results into disorders regarding Nutrition, which may be collectively called Malnutrition disorders.

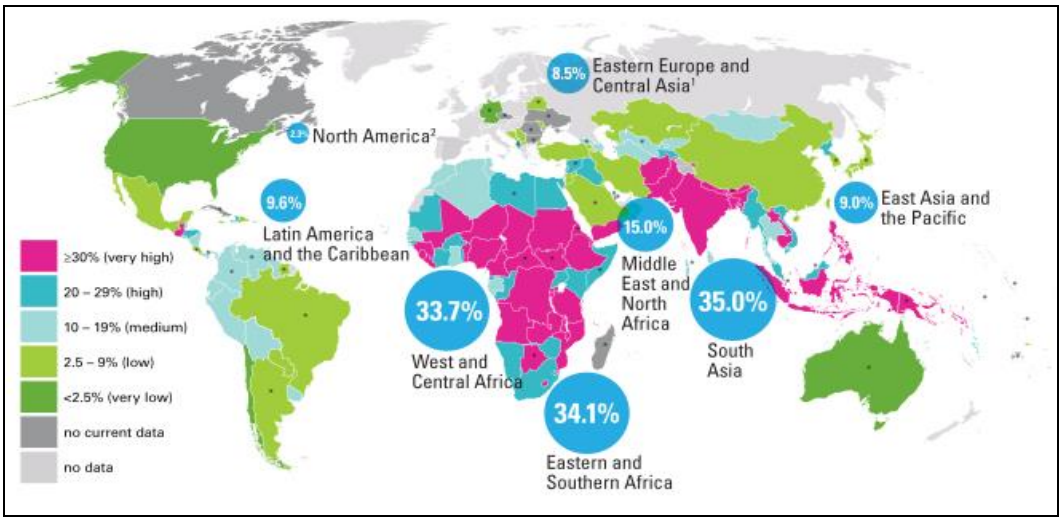

Fig 2: Malnutrition ratio across the globe

Now a days, malnutrition is a global challenge in low-income and middle-income countries particularly in sub-Saharan Africa and South Asia. More than ten million children under five years of age die annually worldwide and percentage of child deaths in South Asia. It was estimated that more than 50% of these child deaths could be attributed to the potential effects of Malnutrition in infectious disease such as diarrhoea, pneumonia, tuberculosis etc.

2. Categories of Malnutrition

Malnutrition is a condition that results from eating a diet in which nutrients are not enough or are too much such that it causes health problems. Malnutrition may include too much or too little: calories, proteins, carbohydrates, vitamins or minerals. It is often use to refer to under-nutrition where, there are not enough calories, proteins or micronutrients; however it also includes over-nutrition where the intake of nutrients is over supplied and the amount of nutrients exceeds the amount required for normal growth, development and metabolism. If under-nutrition occurs during either pregnancy or before the age of two years of age it may it may result in permanent problems with physical and mental development.

Under-nutrition is usually thought of as a deficiency primarily of calories (that is overall food consumption) or protein. Deficiencies of vitamins and minerals are usually considered separate disorders. However when calories are deficient, vitamins and minerals are likely to be also. Under-nutrition which is often used interchangeably with malnutrition, is actually a type of malnutrition. In developed countries, under-nutrition is usually far less common over-nutrition. However under-nutrition occurs, especially in people who are very poor, such as homeless and in those who have psychiatric disorders.

Fig 3: Malnutrition due to poverty

Also people who are very ill may be unable to eat enough food because they have lost their appetite or because their body's need for nutrients is greatly increased. Infants, children and adolescents are at risk of under-nutrition because they are growing and thus need a lot of calories and nutrients. Under-nutrition also occurs in older people. About 1 of 7 older people who leave in the community consumes fewer than 1000 calories a day not enough for adequate nutrition. As many as, half of older people in hospitals and long-term care facilities, do not consume enough calories.

When insufficient calories are consumed, the body first break down fat and uses it for calories-much like burning the furniture to keep a house warm. After fat stores are used up, the body may break down its other tissues, such as muscle and tissues in internal organs, leading to serious problems including death. The most common type of under-nutrition is Protein-Energy malnutrition (PEM), it is severely deficiency of protein and calories results when people do not consume enough protein and calories for a long time. In developing countries protein-energy malnutrition often occurs in children. It contributes to death in some cases. There are two main

forms of protein-energy malnutrition:

Fig 4: children suffering from marasmus

Marasmus is a severe deficiency of calories and protein. It tends to develop in infants and very young children. It is typically in weight loss and dehydration. Breast feeding usually protects against marasmus. Starvation is the most extreme form of marasmus (and under-nutrition). It results from a pair of total lack of essential nutrients for a long time.

Kwashiorkor is a severe deficiency more of protein than of calories. Kwashiorkor is less common than marasmus. The term is derived from an African word meaning "first child-second child" because a first born child often develops Kwashiorkor when the second child is born and replaces the first-born child at the mother's breast because children tend to develop Kwashiorkor after they are weaned, they are usually older than those who have Marasmus. Enlarged fatty liver is very common symptoms for Kwashiorkor.

Fig 5: children suffering from Kwashiorkor, which results increased belly.

Under-nutrition may result from the following:

- Lack of access to food.
- Disorders or drugs
- A greatly increased need for calories.

Taking certain drugs may be contribute to under-nutrition. Many drugs decreases appetite. Drugs like diuretics, digoxin are responsible for under-nutrition. Some drugs cause nausea, which decreases appetite. Others increases metabolism. Some drugs may interfere with the absorption of certain nutrients in the intestine. Also stopping certain drugs or stopping consumption of alcohol may lead to weight loss.

Drinking too much alcohol, which has calories but little nutritional value, decreases appetite. Alcohol damages liver also and interfere with the absorption and use of nutrients.

Smoking dulls taste and smell, making food less appealing. Smoking also seems to cause other changes in the body that contribute to a low body weight. In older people, including age-related changes in the body, work together to cause under-nutrition.

Dietary Management

For most people, treatment involves gradually increasing the number of calories consumed. Eating several small, nutritious meals each day is the best way. Example: people who have been starving are first fed small amounts of food often (6 to 12 times a day). Then the amount of food is gradually increased. If children have diarrhoea feedings may be delayed for a day or two so that the diarrhoea does not become worse. During this interval they are given fluids. People who have difficulty digesting solid foods may lead liquid supplements or a liquid diet (such as yoghurt-based supplements) are used because many people have trouble digesting lactose (a sugar in milk products), under-nutrition can make the problem worse. If such people consume foods that contain lactose, diarrhoea usually results.

Fig 6: Milk, liquid supplements

Multivitamin supplements sometimes given to treat under-nutrition. I think, by giving antibiotics to all severely under nourished children, even if no infection apparent.

Fig 7: Multivitamin supplements

If under-nutrition is severe, people may need to be hospitalized. I also observe one thing during my internships that feeding people so quickly after severe under-nutrition can cause complications such as diarrhoea and imbalance I body water, glucose and other nutrients. This complication usually resolved if feeding is slowed.

Over-nutrition is a condition in which the intake of nutrients is over supplied, the amount of nutrients exceeds the amount required for normal growth, development and metabolism. Over-nutrition occurs when a person consumes a diet that exceeds the necessary requirements for the amount of essential nutrients, or the amount of calories a person needs to remain healthy. In most cases people who suffer from over-nutrition gain excess weight and this can cause many serious problems to the human body.

Fig 8: child obesity due to over-nutrition

Over-nutrition can lead to increased risk of developing heart disease, stroke, type-2 diabetes and even cancers.

Obesity: It is a pathological condition characterized by accumulation of fat much more than is necessary in the body. This form of over-nutrition is more common in developed countries. A man whose body fat amounts to more than 20% of his total weight is considered obese. For a women it is 30% or above.

Hyper-vitaminosis A: It is a condition of thickening of long bones and enlargement of spleens. It also causes lathargy, fatigue, general weakness, insomnia, constipation etc.

Hyper-vitaminosis D: Excessive amounts of vitamin D are potentially dangerous to children and adults. Symptoms are-nausea, vomiting, fatigue, drowsiness headache and constipation.

Over-load of iron or haemochromatosis: Over intake of iron leads to a condition called haemosiderosis (large deposit of iron in the liver). This causes constipation, diarrhoea, heart-burn, nausea and vomiting.

Dietary Management

Diets to promote weight loss are generally divided into four categories: low-fat diet, low-calorie diet and very low-calorie diet. A diet which is a high source of protein should be avoided during weight loss therapy.

Fig 9: Ideal diet for weight loss therapy

Very low-calorie diets provide 190-800 kcal/day, maintaining protein intake but limiting calories from both fat and carbohydrates. They subject the body to starvation and produce an average weekly weight loss of 1.5-2.5 kilograms. These diets are not recommended in normal cases because these types of diet have lots of adverse side effects such as cardiac problems, gouts, electrolyte imbalance etc.

3. Conclusion

It is therefore concluded that, the occurrence of malnutrition is very common not only among children, but the adult and older people as well. A huge number of people from the poor countries particularly in sub-Saharan Africa and South Asia are suffering from under-nutrition due to poverty. As a result, the disease like Marasmus and Kwashiorkor are very common in these countries. In contrast, in the economically rich countries like European countries or USA, many a people across different age groups are the victim of over-nutrition or excess nutrition, which results the increased risk of developing heart disease, stroke, type-2 diabetes and even cancers. The primary prevention for both under-nutrition and over nutrition is only to modify the eating habit, along with prescribed medication.

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