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RESEARCH ARTICLE

EFFECT OF PROTEIN MALNUTRITION ON MENTAL HEALTH AND ITS DEVELOPMENT.

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Abstract

One of the major factors affecting brain development is Malnutrition. In particular, protein malnutrition can result in various neurological conditions. The main cause of behavioural changes in malnourished people may be due to changes on brain connectivity. PEM can cause severe crisis in children's, thereby it can harm the on-going development of brain during childhood. Most of the malnutrition and its neurological conditions can be prevented and it is one of the public health concerns. There are many studies focusing on need of proteins in malnourished people. The present review is mainly done focusing the changes in neurological factors observed in malnourished individuals.

Introduction:-

Malnutrition is the most important nutritional disorder caused due to improper food intake such as having lack of protein, carbohydrates, micronutrients and thereby it is one of the cause of frequent infections. Malnutrition is a condition which is occurring widely, especially in India when compared to other countries. Most of the malnutrition and its neurological conditions can be prevented, but major preventive measures should be taken.
This present review is done to study about various nutritional factors that are helpful to prevent protein energy malnutrition (PEM) with its effects on brain development.

Nutrition is vital for the structural and functional development of the central nervous system (CNS). Recently, the United Nations through the FAO 2014 reported that, 805 million people suffer from higher grades of malnutrition, this means almost one in nine of the world population. It is estimated that one third of these people are women of childbearing age [1]. The impact of malnutrition should be understood by knowing that the brain development differs in term of time of onset and in duration between species and also among different regions on the brain[2]. Epidemiological studies in children exposed to malnutrition show greater changes on behaviour [3]

Insufficiencies of memory related functioning of mind and emotions are connected to structural deviations of brain regions. Brain structures and brain nerves connects to various components of intellectual processes[4]. Malnutrition has long lasting effects in reasoning and behaviour, although the thinking processes like major functions are not fully assessed[5]

Apart from the risk of developing coronary heart disease (CHD), diabetes and hypertension later in life due to malnutrition in early life, there is accumulating evidence of long-term adverse effects on the logical capacity of previously malnourished children. It is difficult, however, to distinguish the biological effects of general malnutrition and those of the depressed environment on a child's cognitive abilities. It is also systematically difficult

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to distinguish the effect of general malnourishment from the effect of micronutrient insufficiencies, such as iodine deficiency during pregnancy and iron deficiency in childhood, which also cause mental and physical impairments.

Different forms or types of Malnutrition found in childrens

Malnutrition refers to changes which occur in the nutritional status leading to nutritional deficiencies. Nutritional deficiency has been widely classified in two ways, depending on the underlying deficit: **calorie malnutrition or marasmus and protein malnutrition or kwashiorkor.**

Marasmus is caused mainly by insufficiency in energy and is characterized by a noticeable loss of fat and muscle, leading to lean appearance of the child. Excluding their other demographic details such as weight and height, children with PEM shows a clear weakness and thereby are at high risk of having frequent infections. The other clinical manifestations include dry and rucked skin, decreased lung volume and heart rate. **Kwashiorkor** is caused by deficiency in protein and is categorized by anorexic, lethargic, oedema, changes in skin and hair colour, anaemic condition, and diarrhoea.

Various forms of malnutrition occurs due to lack of certain micronutrients, such as vitamins or minerals. Much common nutritional insufficiencies found are vitamin A, iron, and iodine, which is also common in the critically ill child.

Hazard Aspects of Malnutrition in the Critically Ill Child

There are various factors that contribute to the commencement of malnutrition in critically ill child. The frequency of causing malnutrition in children's are found to be more under two years of age, increased length of hospital stay, and in those in need of mechanical ventilation, children's already having any heart diseases or have undergone extensive burn injuries are also at increased risk of malnutrition.

Diagnosis of Malnutrition

Diagnosis of malnutrition in children's must be based on an objective evaluation of the nutritional status which includes sufficient history of food intake and weight loss, anthropometric measurements including weight and height, analysis of biochemical parameters mainly blood count, and calculation of the body composition including fluid input and output [6]. An adequate nutritional evaluation is essential in order to institute early nutritional intervention[7].

Association between malnutrition and growth retardation are used for assessing the individual nutritional state, which is usually measured as body mass index (BMI).The classification of malnutrition is mild, moderate or severe which helps to organize clinical observations. Furthermore, the risk of death is directly linked with the degree of malnutrition. In developing countries, about 3.5% of children under the age of 5 years suffer from severe malnutrition. Although mild and moderate types of childhood malnutrition are even more prevalent, their significance in childhood morbidity and mortality is less well recognized [8].

Protein malnutrition was measured using anthropometric measurements mainly focusing on dimensions of different age groups, parents and child's characteristics and as well on height and weight. In few studies, the Height-for-Age (HAZ) and Weight-for-Age (WAZ) scores was found by using the WHO software for assessing growth and development. Haemoglobin concentration was measured using Hemo-Cue photometer [9].

Community guidelines expected at improving the standards of living of the population are often inadequate for economic growth corrected with some social or poor policies. One reason for this is because socio-economic problems such as scarcity, lack of education and social services need to be addressed instantaneously to improve nutrition and health in the long-term.

In recent years, programs have made an initial effort to move towards more integrated and multi-sectorial solutions to food security, through food-based strategies.

Nutritional Factors Affecting Mental Health

Nutritional factors relating to mental health have a common aspect in which several factors are associated with the risk of CVD [10]. Omega-3 FAs are famous for cardio-protective effects, Folic acid (vitamin B9),vitamin B6 and B12 are parts of homocysteine metabolism, and deficiencies of these nutrients result in increased blood levels of

homocysteine, which aggravate mental health. Niacin is an effective modulator to increase high-density lipoprotein cholesterol (HDLC) and vitamin D is associated with the risks of CVD and metabolic syndrome. These nutrients are beneficial for mental health. Conversely, excess intake of saturated fat and sugar, which are risk factors for CVD, is detrimental to brain function [11].

Intake of a nutrient-rich diet provides the body and mind with the energy it requires and assists individuals in maintaining optimal health and welfare. Apart from a rise in chronic diseases many attributed to over nutrition, and being overweight, men consumes less healthy food and are also less proactive about preventing ill-health than women.

Conclusion:-

Malnutrition is prevalent around the world and is a burden on patients and healthcare facilities. Despite of various advances in medicine and clinical care, the simple correction of a patient‘s nutritional status appears to be overlooked or not considered as a sufficient medical priority.

Identifying malnutrition or its cause is fundamental to its treatment. It is therefore expected that many validated tools for nutrition risk screening and nutrition assessment exist for the clinician to use in secondary with the exact identification, referral and treatment of patients who are at risk of malnutrition. The treatment of malnutrition first requires a patient’s condition to be identified via either screening or assessment

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