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لم ترد بالأصل

CONTRIBUTION OF ZINC AND VITAMIN A ON NATURAL KILLER CELL ACTIVITY IN CHILDREN WITH PROTEIN - ENERGY MALNUTRITION

Thesis

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By

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بِسْمِ اللهِ الرَّحْمَٰنِ الرَّحِيمِ

﴿ اللهُ لا إِلَٰهَ إِلَّا هُوَ الْحَيُّ الْقَيُّومُ لا تَأْخُذُهُ سِنَةٌ ولا نَوْمٌ لَّهُ مَا فِي السَّمَٰوَاتِ
ومَا فِي الأَرْضِ مَنْ ذا الَّذِي يَشْفَعُ عِندَهُ إِلَّا بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِم وما
خَلْفَهُمْ ولَا يُحِيطُونَ بِشَيْءٍ مِنْ عِلمِهِ إلاَّ بِمَا شَاءَ وَسِعَ كُرْسِيُّهُ السَّمَٰوَاتِ
والأَرْضَ ولَا يَؤُدُهُ حِفْظُهُمَا وَهُوَ العَلِيُّ العَظِيمُ ﴾

صدق الله العظيم

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Clinical malnutrition is always complicated by deficiencies of one of more vitamins and trace elements. Vitamin A, B6, E, folic acid, iron, zinc and selenium appear to be important for optimum functioning of immune system in laboratory animals and in man. At the same time, excess intake of the same nutrient, for example, zinc and vitamin A may cause impairment of immune responses (Chandra 1992).

Children with protein - energy malnutrition have thymic atrophy (Mugerwa, 1971) and impaired response to infection (Suskind, 1977) and zinc deficiency (Sandstead, 1965). In a study done by Suskind, 1977 in malnourished children, an apparent increase in thymic size after dietary zinc supplementation were noted.

Deficiency of zinc is particularly common because foods that are rich in zinc are expensive high protein foods, body stores are small and requirements increase with diarrhea and depend on energy intake and growth (Wolman et al., 1979).

Zinc is particularly needed for zinc-metalloenzymes, which are essential for nucleic acid and protein synthesis. Zinc deficiency may therefore limit the role of activity (Nauss, 1986). These cells appear to play important roles in natural resistance to some viral and other microbial infections, in rejection of bone marrow transplants and in regulation of immune responses, such as antibody production (Trinchieri, 1989).

The depression of cell mediated immunity, characterized principally by a defect in maturation of peripheral T lymphocytes (Suskind, 1977). This functional disorder, which induces disturbances in distribution of subpopulations of T lymphocytes is thought to originate in the thymus gland (Chandra et al., 1982).

Among the serious complications of PEM are severe infections caused by organisms of relatively low pathogenicity. This was explained by the fact that cell mediated and humoral immunity are defective in PEM (Suskind, 1977).

The aim of our study is to clarify the importance of zinc and vitamin A for eliciting an appropriate immune response. The effect of vitamin A on NK cell activity through estimation of NK cell number using monoclonal antibody will be studied as well as the influence of zinc on cell mediated immunity through estimation of CD3 number using monoclonal antibody.

REVIEW OF LITERATURE

Protein-energy malnutrition

(PEM)

The most important deficiency diseases in the developing countries are PEM, xerophthalmia, nutritional anaemia and iodine deficiency disorders (Latham, 1990). The overwhelming nutritional deficiency problem worldwide in combined terms of extent and significance for morbidity and mortality remains PEM in its various degrees and forms. PEM is not concerned with a specific nutrient but rather with fundamental problems of infant feeding practices and diets totally unsuited to their needs (McLaren, 1992).

The numbers affected at any time (very approximate) with PEM worldwide is estimated to be 500 millions for mild PEM, 100 millions for moderate PEM and 10 millions for severe PEM (McLaren and Meguid, 1988). Over 40.000 of world's preschool children die each day.Most of these children are malnourished (U.S.Agency for International Development, 1987).

In the united states, primary PEM is less commonly seen (Avery & Rotch, 1991). There is, however, an increasing awareness of occurrence of malnutrition secondary to disease states (Fuchs, 1990)such as diarrhea (Sallon et al, 1988)AIDS (Warrier et al, 1988), cancer (Smith et al, 1991), intra-uterine growth retardation (Gayle et al, 1987)

Classification

There is no universally accepted criteria for defining the severity of PEM although it is often categorized as mild, moderate or severe (mason & Rosenberg, 1991).

Gomez (1946) divided PEM into first, second and third degrees (using weight for age). This is corresponding to body weights of 90 -76 %, 75- 60% and less than 60% of the expected body weights of harvard standard .All cases with nutritional oedema irrespective of weight were included in the 3rd degree (McLaren, 1992) **Table (1).**

In 1966, Jelliffe modified the Gomez classification and divided PEM into four groups 1st ,2nd,3rd and 4th group at intervals of 10% body deficit **(table 2).**

The Wellcome (1970) classification of PEM has been widely accepted : **a.** Marasmus with weight less than 60% of Boston median for age, **b.** Marasmic kwashiorkor with weight below 60%and oedema present, **C.** Kwashiorkor with weight greater than 60% and oedema present, **D.** Under weight with weight 60-80 % and no oedema **table(3).**

Waterlow (1972) has used the rates of height / age and weight / height in order to signpost degrees of malnutrition , This definition of two separate degrees of malnutrition has been in general use now for almost 20 years.

These definitions are: