IMMUNITY BOOSTING AND MICRONUTRIENTS: AN ASPECT TO PAY ATTENTION

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ABSTRACT:

Nutrition is an important aspect to allow all the cells in our body to function properly, including the cells in immune system. Immune system plays an important role in fighting against diseases. The possible response of immune system against body cells is called auto immune reaction. No single food can be described as superfood that can tend to increase immunity. It is always the balanced intake of all micro and macro nutrients from all five food groups that can help to build healthy immune system. Therefore, we must include biologically valuable proteins, energy giving foods, micronutrients and antioxidants in our daily diet to provide protection.

INTRODUCTION:

A better understanding of the role of nutrients in immune function will facilitate the role of nutrition to improve human health. Nutrients may impact directly or indirectly upon immune cells causing changes in their function or may exert effects via changes in the gut microbiome. Cells of immune system must be able to distinguish self from non-self and furthermore discriminate between non-self molecules which are harmful and innocuous. Cells of immune system may be divided into those of innate and those of adaptive immune response. The innate response is the first response to an invading pathogen. The innate response is rapid but not specialised and is generally less effective than adaptive immune response. The adaptive immune response has the ability to specifically recognize a pathogen and remember it if exposed to it again. T-cells are critical in antigen recognition and the coordination of the immune response. Broadly they are divided into cytotoxic T cells and the T helper cells.

Cytotoxic T cells are involved in killing of infected damaged cells and tumour cells. T helper cells (Th), Th1 cells produce interferon gamma (IFN-γ) and interleukin (IL)-2 which are important in antiviral and cellular immune responses.Th2 produce IL-4, IL-5 and IL-3 which are involved in hum oral (antibody) and anti parasitic responses.

The 17 cells produce IL-17 A, IL- 17 F and IL-22 which are important in fighting bacteria and fungi. The other lymphocytes of the adaptive immune system are the B cells which are responsible for antibody or immunoglobulin (Ig) production. Like T cells, B cells respond specifically to an antigen. They can differentiate into short lived plasma cells which produce one of the five classes of Ig (IgM, IgD, IgG, IgA and IgE). Each class of Ig has specialized role.

ROLE OF MICRONUTRIENTS IN IMMUNITY AND GENERAL WELL BEING

Vitamin C: Since Vitamin C is a powerful antioxidant it has antibacterial and anti inflammatory effects against pathogens. It also stimulates the production of antibodies and white blood cells that prevent disease. Rich sources include amla, guava, green chillies and all citrus fruits

Vitamin E: Vitamin E is also a potent antioxidant known to improve immune functions. Higher concentrations of Vitamin E are found in immune cells compared to other cells in the body. Vitamin E also regulated number of natural killer cells that prevent viral infections. To have Vitamin E in body eat plenty of nuts and seeds like almonds, hazelnuts, pistachios, pumpkin seeds and cashews.

Vitamin A: For rich sources of Vitamin A non vegetarian foods are good as it is a fat soluble vitamin. Apart from this beta carotene which is a precursor of Vitamin A is found in all yellow and orange coloured fruits and vegetables. Although we associate Vitamin A deficiency with night blindness and conjunctiva but it has major role to play in maintaining epithelial cells of our body. Vitamin A is also known to enhance immunity by regulating antibacterial and anti-inflammatory immune responses to infectious diseases like tuberculosis, pneumonia, malaria and herpes.

Vitamin D: Vitamin D is a fat soluble vitamin, different from others in that a major source is derived from UV light-induced conversion of its precursor under the skin. Dietary sources include fortified foods and supplements. Vitamin D deficiency may affect the immune system as Vitamin D plays an immune-modulation role, enhancing innate immunity by upregulating the expression and secretion of antibacterial peptides. Recent researches have suggested that Vitamin D has a potential role in prevention of acute respiratory infection by increasing immunity. It was observed that low Vitamin D level in blood is associated with increased incidence of respiratory tract infections.

Iron: Iron is essential for almost all living organisms and takes part in a number of important biological processes. Its ability to switch between multiple oxidation states makes it an important co-factor in electron transfer and oxidation-reduction reactions, and also allows it to interact reversibly with other atoms, especially oxygen, sulphur and nitrogen. Iron is a fundamental element for normal development of the immune system. Its deficiency affects the capacity to have an adequate immune response. The role of iron in immunity is necessary for immune cells proliferation and maturation, particularly lymphocytes, associated with the generation of a specific response to infection. The body has the capacity to reduce the iron availability to be consumed by infectious elements by proteins such as transferrin and lactoferrin. Also, iron is essential for the proliferation of bacteria, parasites, and neoplastic cells. Thus, excess iron could potentially facilitate the development of infections and the invasion of tumoral cells.

Zinc: The micronutrient zinc is important for maintenance and development of immune cells of both the innate and adaptive immune system. A disrupted zinc homeostasis affects these cells, leading to impaired formation, activation, and maturation of lymphocytes, disturbed intercellular communication via cytokines, and weakened innate host defence via phagocytosis and oxidative burst.

Selenium: As an antioxidant, selenium reduces inflammation and prevents cellular damage caused by free radicals, thereby reducing the risk of chronic diseases. Selenium also has powerful antiviral effects against respiratory infections like influenza and asthma. In high concentrations, it can also inhibit the spread of cancer cells. Selenium can be found in a variety of foods including beans, nuts, legumes, fatty fish, unprocessed dairy products, fruits, plain yogurt, whole grain oats, mushrooms, seeds and barley.

CONCLUSION:

Considering the high prevalence of micronutrient deficiency among all age groups, there is a need to enhance the availability, access and utilization of locally available foods rich in micronutrients. Addressing micronutrient deficiencies is a public health concern worldwide and also an individual's take on how to eradicate deficiency from their home, city, country and world.