



A Study on Interrelationship between Nutrition and Immunity System

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ORIGINAL ARTICLE



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ABSTRACT

A well-functioning immune system is crucial for survival. For better functioning of immunity system nutritional status plays an important role. Macro- and micronutrients play a critical role in cellular functioning, and therefore an appropriate diet for the best immunological outcomes would be one that supports immune cell functions and allows them to initiate effective responses against pathogens, but also to rapidly terminate the response when needed and avoid underlying chronic inflammation. Nutrition can affect the micro biome, gut barrier function, inflammatory processes, and white blood cell function, all of which can influence immune function. In this article from nutrients, investigate the relationship between diet, nutrients, and the immune system. It describes the key functions of nutrients important to the immune system and their importance to a healthy body. This includes the role of macro and micro nutrients and the gut microbiome in intervene immunological effects.. The rainbow diet is a diet rich in colorful nutrients that boost the immune system, and millet is a traditional Indian food rich in macro and micronutrients that also boost the body's immune system. Diet modifications for the immune system applies in maximum clinical set ups, but may also play a role in society by reducing or delaying the onset of immune-intervene chronic diseases. Future research in this field will ultimately lead to a better understanding of the role of nutrition and immunity system and expedite the proper use of macro and micro nutrients to improve human health.

KEY WORDS

Nutrition, Micronutrients, Immune System, Macronutrients, Inflammation, Diet and Health.

INTRODUCTION

Nutrition is an important component of the immune response, and malnutrition is the most common cause of immune deficiency worldwide. Macronutrients - dietary proteins, carbohydrates and fats, and micronutrients (vitamins and minerals) - interact with immune cells in the blood, regional lymph nodes, and specialized gastrointestinal immune system. Alterations in immune responses are seen even when nutrient deficiencies are quite mild. Among the micronutrients, zinc, selenium, iron, copper, vitamins A, C, E, and B-6, as well as folic acid, have a significant impact on immunological responses. Obesity and overeating both lower immunity. In the elderly, weakened immunity can be improved by small amounts of a combination of micronutrients .

The Role of Nutrition in Immune Function

All cells require adequate and proper nutrition to function at their best, and immune system cells are no exception. Energy requirements during infection are further increased by a “active” immune system; for example, basal energy requirements rise during fever. Thus, an ideal diet for the best results with your immune system would be one that helps immune cells do their jobs, enabling them to start an both to quickly end the response when necessary and to mount an efficient defence against infections necessary and prevent underlying persistent inflammation. When exogenous sources, such as food, are insufficient, endogenous sources, such as body storage, can be used to supply the immune system’s needs for nutrients and energy. Certain micronutrients and dietary elements have particularly special roles in the lifelong development and maintenance of a healthy immune system or in the reduction of chronic inflammation. For instance, the micronutrients vitamin A and zinc govern cell division and are therefore necessary for a successful proliferative response by the immune system, and the amino acid arginine is required for the generation of nitric oxide by macrophages.

Objective of the Study

1. To analyze the dietary influences on immunity system.
2. To know the relationship between diet and the health of a person’s immune system.
3. To know which nutrients are important to boost an individual’s immunity.

Scope of the Study

The main goals of nutrition are not only energy and protein production, but also specific nutrients to increase resistance to disease, strengthen the immune system, and influence the inflammatory response in an individual sense.

Methodology

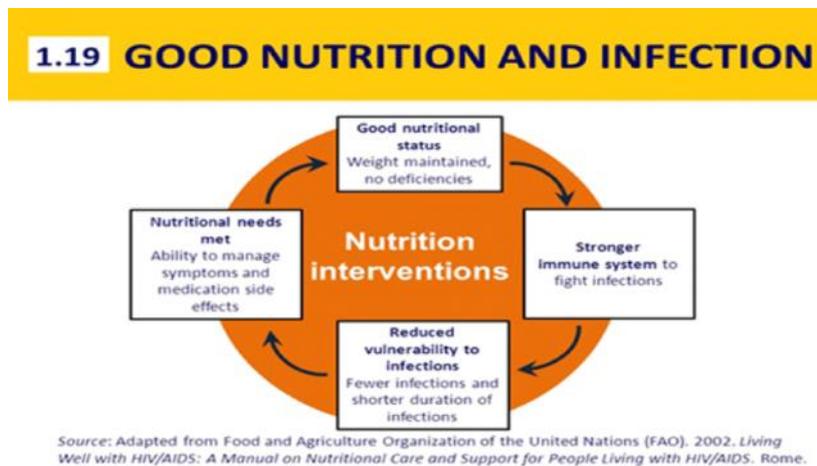
A comprehensive literature search was performed by electronically searching the database in all domains (PubMed, ncbi, Books and many more) using the following search strategies, including keywords:

1. (immune system) and (micronutrients) OR (macronutrients) OR (nutrients) OR (immune health) OR (immunity) OR (immune response),.
2. (any micronutrient/macronutrient) AND (immune system) OR (immunity)
3. (any micronutrient/macronutrient) AND (immune system) OR (immune function), including research and clinical studies to examine articles in English.

Results

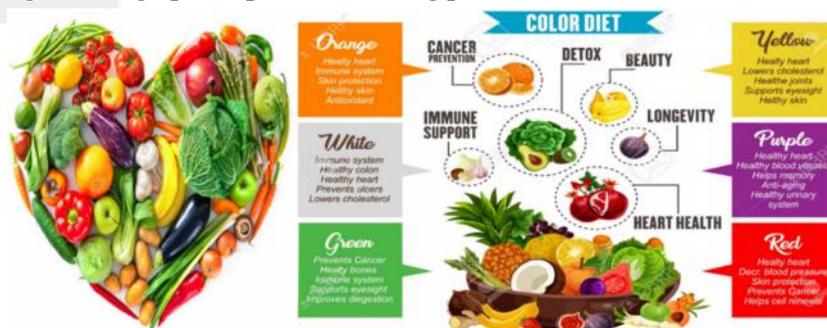
Can diet affect the immune system? YES

- A person's diet affects their immune system, just like all other aspects of health.
- Diet can affect the microbiome, gut barrier function, inflammatory processes, and White blood cells may become less functional and immune function may be compromised.
- Dietary habits and individual foods are associated with increased risk of disease, increased risk of allergies and impaired immune response.
- Although it is clear that food choices affect overall health, including immune function, the interaction between diet and immune health is extremely complex. Scientists are still figuring out how the foods a person eats can help or hurt immune function.
- A good, balanced diet that includes all the essential micronutrients can help boost the immune system, increase energy levels, and maintain body weight and overall well-being.
- Research has shown that eating a variety of nutrients can work together to: Boost your immune system. (Rainbow Diet).



Rainbow Diet

- The rainbow diet is not a strict nutritional regimen. Unlike ALL, it contains all the macro and micronutrients the body needs and therefore can be followed for a lifetime.
- At its core, the Rainbow Diet is about eating a varied diet with large quantity of vegetables and fruits. This is in line with the guidelines of most nutritionists and will not only improve your weight, but also your energy levels and overall health.
- The basis for the diet is the recognition that each food color represents a specific type of antioxidant - for example, red-colored foods are usually rich in antioxidants that protect both short-term and long-term memory and help prevent some cancers and heart disease.
- Eating a rainbow every day ensures plenty of choices and you can get protective and beneficial nutrients without getting too hung up on a particular eating plan.



Benefits of Millet and its Role in Strengthening the Immune System

Do you know what the staple food of India was decades ago?

Researcher was surprised to find out it was humble millet. 1/3 of the world today population regularly consumes millet. But the little grain finally got it's own Popular as a superfood and source of immunity. Millet is doing well become a nutrition superstar. Millet is a rich source of various micronutrients, including: Calcium, Thiamine, Magnesium. These micronutrients support the immune system. Millet is an excellent source of protein and rich in fiber, vitamins, minerals antioxidants and micronutrients. Older crops such as millets - jowar, ragi, bajra and other small millet are promising grains that are nutritionally superior to the main grains and serve as a source of high-quality protein, Fiber, vitamins, minerals, antioxidants, and micronutrients. Millet seems to be in demand because it is known to boost the immune system.

Millet has potential health benefits, and epidemiological studies have shown that consumption of millet reduces the risk of heart disease, protects against diabetes, improves the digestive system, reduces the risk of cancer, detoxifies the body, increases immunity in respiratory health, increases energy levels, improves the muscular and nervous systems, and protects against various degenerative diseases such as metabolic syndrome and Parkinson's disease (Manach et al., 2005; Scalbert et al., 2005; Chandrasekara and Shahidi, 2012).

Traditional Millet Formulations

Khichudi, Pulao, Roti, Dosa, Idli, Malt, Porridge, Biscuits, Cookies, Pancakes and many more which are healthy and nutritious so add at least one millet in your daily diet regime to boost immunity system.

CONCLUSION

In this article, the study is conclude that balanced diet with proper consumption of macro and micro nutrients and other healthy habits contribute and to the health and boost our immune system. It is important to eat the right diet and consume certain nutrients to support the traditional function of your system. Stay at home and eat home cooked food consisting of complex carbohydrates like cereals / grains / millets, good quality proteins like milk (dairy/nettle / curd), millets (ragi / bajra etc), soybeans, oats, pulses, rajma / cholle / guguni / channa, sprouts etc. A daily intake of immune nutrients like vitamin A, C, E, B-complex, zinc and selenium which are present in large quantity in green leafy vegetables, lemons, oranges, amla, broccoli etc. helps to strengthen our immunity. A better understanding of the role of nutrition in immune function will facilitate the use of reliable and appropriate foods to improve human health.

Correct Nutrition = Strong Immunity

Recommendations

- It is important to realize that no single food or nutrient can prevent disease. The immune system is incredibly complex and influenced by many other factors including stress, age, sleep and other conditions.
- Good nutrition is essential for a strong immune system that protects against seasonal illnesses such as flu and allergies, abnormal cell development and cancer.
- Building immunity and good defenses is important for good health. In fact, the immune system is a system, not a single unit.
- Energy intake should be adequate to meet needs, as both over- and under-nutrition can lead to poor immunity.
- Among the nutrients that keep our immune system functioning well is protein, which plays a vital role in the body's immune system, especially in healing and recovery. Eat a variety of protein-rich foods, especially protein combinations such as dairy/grains + cereals, high-quality protein such as lean chicken, fish, eggs, etc. At least 20-30 g of protein should be included in every meal. Vitamins A, B6, B12, C and D as well as copper, folic acid, iron, selenium and zinc. Be sure to get these nutrients through a

healthy, varied diet of vegetables, fruits, nuts and seeds, whole grains, dairy products, or fortified alternatives.

REFERENCES

1. Raymond J, Morrow K. Krause and Maha and the Nutrition Care Process, 15th Philadelphia : Saunders: 2020.
2. Srilakshmi B. *Dietetics*, 8th edition. New Delhi: New Age International Publishers: 2019.
3. www.researchgate.net/publication/287378163_Nutrition_and_immunity N. S. Scrimshaw and J. P. SanGiovanni, Am. J. Clin. Nutr., 1997, 66, 464S. S. Cunningham-Rundles, *Nutr. Rev.*, 1998, 56, S27–S37
4. Nutrition and the immune system: an introduction R K Chandra 1 Affiliations PMID: 9250133 DOI: 10.1093/ajcn/66.2.460S
5. <https://pubmed.ncbi.nlm.nih.gov/12142969> Nutrition and the immune system from birth to old age - PubMed Nutrition and the immune system: an introduction – PubMed
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6723551> Diet and Immune Function - PMC – NCBI.
7. <https://pubmed.ncbi.nlm.nih.gov/36211413> You are what you eat: How to best fuel your immune system Diet and Immune Function - PMC – NCBI.
8. <://www.ncbi.nlm.nih.gov/pmc/articles/PMC8201077> <https://www.medicalnewstoday.com/articles/how-and-why-does-diet-influence-immune-function>
9. <https://www.boldsky.com/health/wellness/nutrition-tips-for-strong-immune-system-for-people-with-aids-131127>.
10. https://www.business-standard.com/article/health/get-enough-protein-focus-on-vitamins-minerals-to-boost-your-immunity-120041801191_1.html
11. Guillin OM, Vindry C, Ohlmann T, Chavatte L. Selenium, selenoproteins and viral infection. *Nutrients*. 2019 Sep;11(9):2101. Wessels I, Maywald M, Rink L. Zinc as a gatekeeper of immune function. *Nutrients*. 2017 Dec;9(12):1286.
12. <https://www.business-standard.com/article/health/get-enough-protein-focus-on-vitamins-minerals-to-boost-your-immunity>
13. <https://www.omicsonline.org/open-access/the-effect-of-nutritional-elements-on-the-immune-system-2165-7904.1000152.php?aid=10186>
14. *Nutrients*. 2019 Aug; 11(8): 1933. Published online 2019 Aug 16. doi: 10.3390/nu11081933 PMID: 31426423 Diet and Immune Function Caroline E. Childs, 1 Philip C. Calder, 1,2 and Elizabeth A. Miles 1,*
15. <https://www.mayoclinichealthsystem.org/hometown-health/speaking-of-health/support-your-immune-function-with-good-nutrition>
16. <https://timesofindia.indiatimes.com/life-style/food-news/benefits-of-millets-and-their-role-in-increasing-immunity/photostory/82735923.cms>
17. Manach et al., 2005; Scalbert et al., 2005; Chandrasekara and Shahidi, 2012.
18. S., Solanki & Gurjar, Durga. (2020). Relation between nutrition and immunity. 8. 2337-2342.
