Immune Support During Pregnancy: The Role of Micronutrient Supplementation

Immune system during pregnancy

The maternal immune system encounters some challenges during pregnancy:[1]

- Building and maintaining **tolerance to the fetus.**
- Keeping the ability to **fight viruses and germs.**

The maternal immune system changes with the fetus's growth and development throughout pregnancy. **A successful pregnancy is dependent on these adaptations.**[1]

1st Trimester

Pro-inflammatory state
(embryo implantation and placentation)

2nd Trimester

Anti-inflammatory state
(fetal growth)

3rd Trimester

Second pro-inflammatory state
(to start of labour)

However, these alterations may increase vulnerability to intracellular infections such as viruses, intracellular bacteria, and parasites.

References

1. Vale, A. J. M., Fernandes, A. C. L., Guzen, F. P., Pinheiro, F. I., de Azevedo, E. P., & Cobucci, R. N. (2021). Susceptibility to COVID-19 in pregnancy, labor, and postpartum period: immune system, vertical transmission, and breastfeeding. Frontiers in Global Women's Health, 2, 602572..

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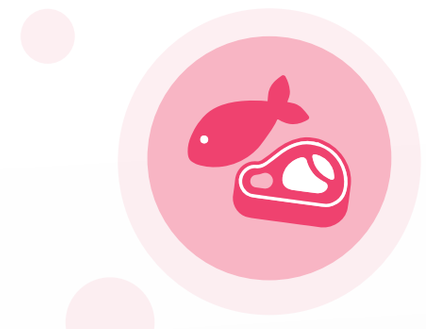
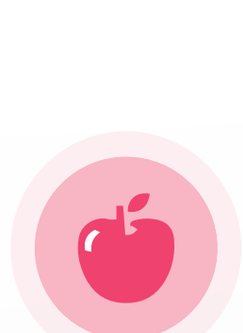
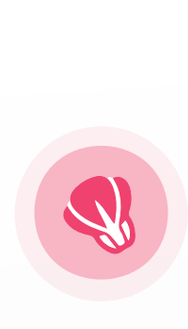
Enhancing immunity with nutrition?







Pregnant women should be adviced to consume a variety of foods to to keep the adequate functioning of their immune system:[1]

Fresh vegetables and legumes, fruits, grains (high cereals fiber varieties).

Dairy products (milk, yogurt, cheese).

Meat (lean meat, fish, poultry, egg).

Nutrient needs, especially micronutrients, **are increased during pregnancy** and deficiencies of certain vitamins and minerals are quite common during pregnancy, which can increase the risk and severity of infection.[1]

Thus, micronutrient supplementation should also be advised to guarantee needs are being covered.[1]

Inflammation induced by COVID-19 infection may be associated with adverse pregnancy outcomes such as:[1]

- Miscarriage
- Preterm birth, still birth
- Affect several aspects of fetal brain development
- Even preeclampsia in pregnancy

References

1. Khan, S., Zeb, F., Shoaib, M., Nabi, G., Haq, U., Xu, K., & Li, H. (2020). Selected Micronutrients: An Option to Boost Immunity against COVID-19 and Prevent Adverse Pregnancy Outcomes in Pregnant Women: A Narrative Review. Iranian Journal of Public Health, 49(11), 2032-2043.

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Specific micronutrients play an important role in supporting immune maternal health:

Iron, Zinc, Selenium and vitamins A, C, D and E have key roles in the immune system[1]

- Roles in inflammation, antioxidant effects, and effects in oxidative burst.
- Maintenance of structural & functional integrity of mucosal cells in innate barriers (e.g., skin, respiratory tract).
- Antibody production and development
- Differentiation, proliferation and normal functioning of T cells.
- Responses to antigen.
- Differentiation, proliferation, functioning, and movement of innate immune cells.
- Antimicrobial effects.

Pregnant women **need optimal levels of micronutrients** for maximal immune support.[2]

Bridging the gap between dietary intakes & micronutrient supplementation may result in **optimal immune function & reduction in the risk of infection.**[3]

A robust diet coupled with micronutrient supplementation can enhance immunity against infection and prevent such outcomes.

References

1. Khan, S., Zeb, F., Shoaib, M., Nabi, G., Haq, U., Xu, K., & Li, H. (2020). Selected Micronutrients: An Option to Boost Immunity against COVID-19 and Prevent Adverse Pregnancy Outcomes in Pregnant Women: A Narrative Review. Iranian Journal of Public Health, 49(11), 2032-2043. **2.** Tourkochristou, E., Triantos, C., & Mouzaki, A. (2021). The influence of nutritional factors on immunological outcomes. Frontiers in Immunology, 12, 665968. **3.** Gombart, A. F., Pierre, A., & Maggini, S. (2020). A review of micronutrients and the immune system–working in harmony to reduce the risk of infection. Nutrients, 12(1), 236.

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