

Lactating Mother and Infant Fight Against Covid-19

Nidhi¹ and Dr. Neetu Singh²

Research scholar¹ and associate professor²

Department of Human Development and Family Studies,
School of Home Science Babasaheb Bhimrao Ambedkar [A Central] University] Lucknow -
226025, Uttar Pradesh, India
Email.id – nidhigautam451@gmail.com

ABSTRACT

Beginning in tardy 2019 incipient strain of virus 9, a novel coronavirus labeled SARS-CoV-2 spread around the world, affecting millions. COVID causes respiratory plot contaminations that can elongate from gentle to pernicious. during the current pandemic, no efficacious preventive and curative medicine is available, a salubrious immune system is one of the most consequential weapons. Alimentation plays a vital role for every stage of life and congruous intake of Vitamins and Minerals can boost up the immune system and avail to obviate and treat several infectious diseases. A well-functioning immune system is consequential to avail minimize the jeopardy of infections. Breastfeeding is the substructure of baby and minute kid endurance, alimentation and advancement, and maternal wellbeing. The WHO pronounces breastmilk as the ideal alimentation for newborn children in light of the fact that is sheltered, unsullied, and contains antibodies that avail secure against numerous fundamental youth sicknesses. Since March eighteenth, 2020, the WHO suggests that ladies with COVID-19 can breastfeed on the off chance that they wish to do as such, in light of the possibility that through breastmilk the children would get antibodies and belligerent to infective components that avail shield infants from getting contaminations.

Keywords: *Breastmilk, COVID-19, Infant, Lactating Mothers, Nutrients*

INTRODUCTION

In tardy 2019, a respiratory infection commenced spreading amongst denizens in the city of Wuhan China. It was expeditiously attributed to a prior unknown coronavirus, which was given the designation novel SARS-CoV-2.^[1] On March 11, 2020, the World Health Organization [WHO] declared the outbreak a pandemic.^[2] The causal agent of COVID-19 is SARSCoV-2 [Rigorous Acute Respiratory Syndrome Coronavirus-2] as officially designated by ICTV

[International Committee on Taxonomy of Viruses].^[3] Coronaviruses are designated for the crown-like spike on the surface.^[4] “Corona” in Latin denotes “halo” or “crown”.^[5] ‘CO’ stands for corona, ‘V’ for the virus, and ‘D’ for the disease.^[6] COVID-19, caused by rigorous acute respiratory syndrome coronavirus 2 [SARS-CoV-2], has spread ecumenically with substantial consequences for public health.^[7]

Several vitamins and minerals play consequential and complementary roles in fortifying both the innate and adaptive immune systems including vitamins A, B6, B12, C, D, E, folate, zinc, iron, selenium, magnesium, and copper.^[8] Many herbal products are found to have immune-modulatory and antiviral properties, so their revelation can be a milestone in the aversion and control of COVID-19.^[9] Raw honey has antioxidant properties and some microbial effects; it is auxiliary for coughs and sore throats and can be integrated into tea or sultry dihydrogen monoxide with lemon. Garlic, fresh, aged extract, and garlic supplements, may abbreviate the astringency of upper viral respiratory infections and function in obviating viral infections of the mundane cold.^[10] Turmeric contains a bioactive compound kenneled as curcumin, which acts as an anti-inflammatory agent in India for curries and other dishes.^[11]

During the COVID-19 pandemic decreases in breastfeeding predominance will conceivably transpire because of impediments in the arrangement and utilization of wellbeing administrations and perturbances to the potentiating condition.^[12] As designated by WHO, if a lactating mother tainted with COVID-19 or different mystifications is too unwell to even consider breastfeeding her child, she ought to be upheld to securely offer her infant with breastmilk in a salutary, conceivable way that is copacetic to her.^[13] IgA antibodies with reactivity to the COVID-19 infection have been distinguished in breastmilk.^[14] Breastfeeding offers different advantages both to the mother and the infant including the posit of the child accepting maternal antibodies against the infection.^[15] Mother and baby ought to be potentiated to cohere while living in for the duration of the day and night and to rehearse skin-to-skin contact, including kangaroo mother care, categorically the following birth and during the substructure of breastfeeding, regardless of whether they or their newborn children have suspected or affirmed COVID-19.^[16] breast milk has defensive exercises.^[17] Lymphocytes, including T cells, mundane executioner cells, and immunizer distributing B cells, make up 10% of the leukocytes in human Expressed milk. one of the most bountiful proteins in human milk, supplementally restricts bacterial development by eliminating rudimentary iron.^[18]

LACTATING MOTHERS FIGHT AGAINST COVID-19



figure-1 lactating mothers fight against covid-19

ROLE OF NUTRIENTS

VITAMIN A

Vitamin A and its metabolites avail to modulate innate immunity along with barrier function and withal control neutrophil maturation.^[19] The main vitamin A sources are organ meats, milk, cheese; in green vegetables and yellow fruits are present provitamin A carotenoids.^[20] prominent role in the immune system and its efficacy against infections, vitamin A is considered an “anti-infective” vitamin.^[21]

VITAMIN D

Vitamin D is a paramount micronutrient for health because of its function in bone, immune, etc. ^[19] sources of vitamin D are sunlight, fatty fish, fish oils, egg yolks, cheese. Vitamin D is especially kenneled for its faculty to truncate the “cytokine storm” that contributes to the pathogenesis of sundry viral infections, including COVID-19.^[20]

VITAMIN C

Vitamin C has antioxidant properties and plays a major role in the immune system of the human body. Vitamin C supplementation enhances the activity of natural killer cells.^[19] The main sources of vitamin C are citrus fruit, tomatoes, potatoes, and green leafy vegetables.^[20] Vitamin C's primary function in the immune replication against infections is to act as a potent antioxidant.^[21] Vitamin C is known as an essential antioxidant and enzymatic co-factor for many physiological reactions in the body, such as hormone engendering, collagen synthesis, and immune potentiation.^[22]

VITAMIN B-COMPLEX

B vitamins are mainly involved in intestinal immune regulation and avail in the gut-barrier functions. Vitamin B12 increases the phagocytic and bacteria-killing capacity of neutrophils while vitamin B6 avails in the lymphocyte proliferation and increases the number of T lymphocytes in the blood.^[19] Each B vitamin has a unique function and plays a vital role in immunity to combat infections. vitamin B2 is involved in cellular energy-yielding metabolic processes. Vitamins B6, B12, and B9 [folic acid] enhance natural killer cell activity, which provides a consequential antiviral Bulwark.^[21]

VITAMIN E

Vitamin E acts as a scavenger of free radicals by blocking the peroxidation of polyunsaturated adipose acids [PUFA] and additionally acts as antioxidants. vitamin E is a paramount nutrient in the immune system. The prevalent sources of vitamin E are Plant oils [soy, corn, olive], nuts, seeds, wheat germ.^[19] vitamin E plays an essential role in enhancing the engendering of natural killer cells and interleukins. It significantly contributes to the proliferation of lymphocytes and elicits a robust immune reaction against pathogens.^[21]

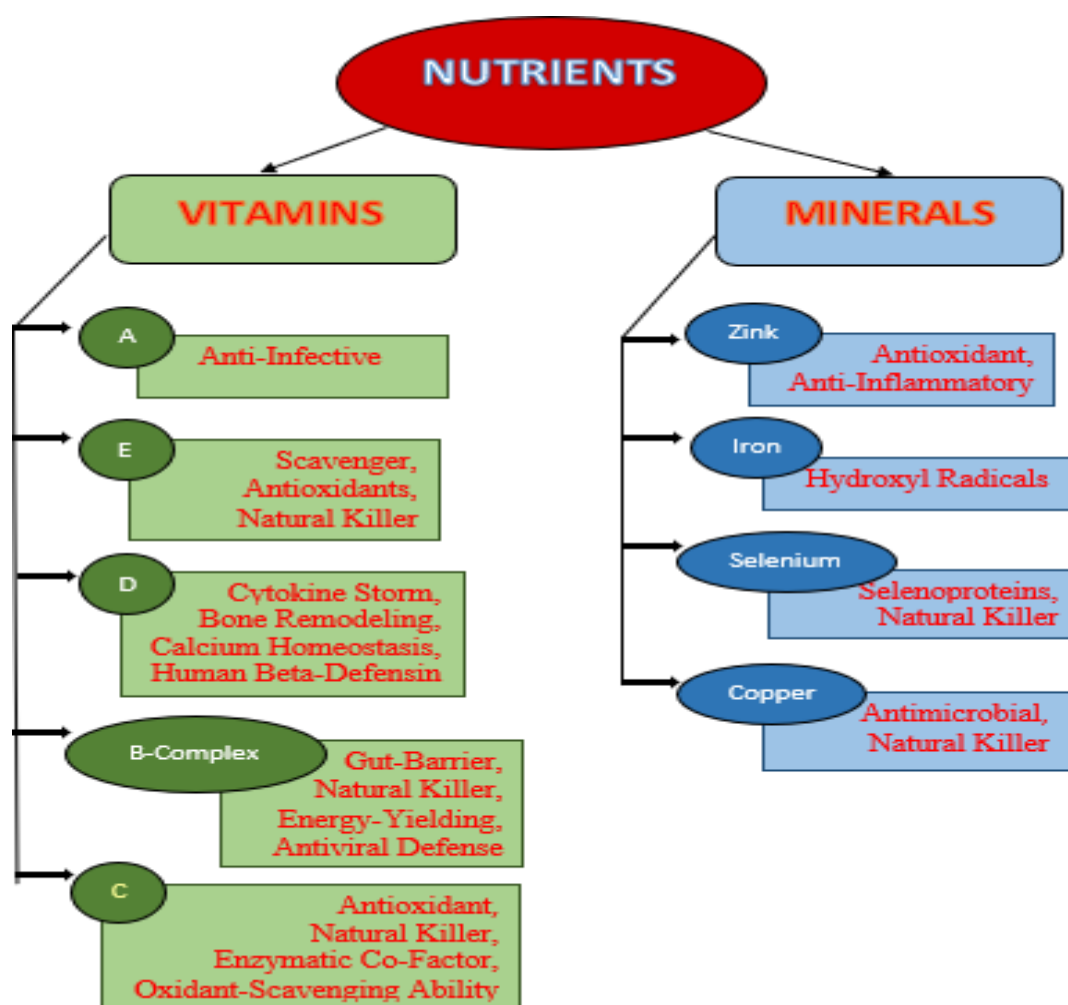


figure-2 Role of nutrients

IRON

Iron is an indispensable nutrient and contributes substantially to the development of immunity. In the context of the current COVID-19, maintaining ample levels of iron could be subsidiary. Iron contributes to the upregulation of the immune replication but dysregulates iron homeostasis that regulates proinflammatory cytokine engendered.^[21]

ZINC

In this COVID-19 situation, zinc is considered as an auxiliary treatment therapy as it has direct antiviral effects.^[19] sources of zinc are animal products such as meat, fish, eggs, and dairy, but it is withal contained in whole grains, nuts, and legumes.^[20] The primary defensive mechanism by which zinc forfends against bacterial and viral infections is its role as an antioxidant.^[21]

SELENIUM

Selenium enhances the function of T lymphocyte and B lymphocyte and additionally increases the activity of the natural killer cells.^[19] the primary sources for this element are meat, bread, mushrooms, dairy products, fish, seafood, and nuts. selenium plays a particular role in ACE inhibition, suggesting its benign role against COVID-19.^[21]

COPPER

Copper has antimicrobial properties and additionally increases the activity of natural killer cells and neutrophils, monocyte function. The mundane sources of copper are nuts, shellfish, and some vegetables.^[19]

TULSI [HOLY BASIL, OCIMUM SANCTUM]

Tulsi has antimicrobial, anti-oxidant, anti-inflammatory, hepatoprotective, immune-modulatory properties.^[11] Its denoted as the “Elixir of life” for its rejuvenating capability and promising potential in remedying different health ailments. Tulsi extracts against our fight against COVID-19 due to its apperceived role in inhibiting replication of SAR-CoV with ACE II blocking properties.^[23]

DALCHINI [CINNAMON]

It is a potent immune system booster and is utilized in sundry ailments like flu, indigestion, edema, cough, etc. ^[11]

GINGER [ADRAKH, ZINGIBER OFFICINALIS ROSCOE]

Ginger is prominent for its anti-inflammatory, antifungal, and anti-cancer properties. In traditional medic been extensively utilized for remedying colds and coughs, nausea.^[11] The presence of antioxidant compounds potential anti-inflammatory as well immune-boosting characteristics, which avails in enhancing the mundane metabolic activities in the human body, fight against infections and toxins to shield against inimical effects of bacteria, virus and any other diseases.^[23]

GARLIC [LAHSUN, ALLIUM SATIVUM]

Garlic has potent anti-oxidant properties and avails in abbreviating stress and high blood pressure.^[11] It is efficacious against sundry bacteria, virus and fungal pathogens hence its antibacterial, antiviral, anti-inflammatory and antifungal property is prominent.^[23]

TURMERIC [HALDI, CURCUMA DOMESTICA]

It has antiseptic properties with substantial antibacterial, antifungal, anti-inflammatory, and antiviral properties. Turmeric avails in the natural cleansing of the respiratory tract; it withal

fortifies in fighting against infection and its anti-inflammatory quality assuages individuals in cases of arctic and flu.[23]

OMEGA-3 ADIPOSE ACIDS

omega-3 adipose acids play a crucial role in the resolution of inflammation induced by infections, including in the respiratory tract. omega-3 adipose acids supplementation and respiratory infections/illness, and the potential role in amending the acute lung injury and acute respiratory distress syndrome [ARDS].[20]

PROBIOTIC

Probiotics are defined as live micro-organisms that confer a health benefit to the host, including on the gastrointestinal tract, when administered in adequate quantities.[22] Probiotics contain "good bacteria" that both support gut health and influence the function and regulation of the immune system.[10]

NUTRACEUTICALS

Nutraceuticals are products that claim physiological benefit or aegis against chronic disease. These products may range from isolated nutrients, herbal products, dietary supplements, genetically engineered designer foods, concrete diets, and processed foods, such as cereals, soups, and beverages.[22]

EXERCISE/ YOGA

Exercise with medium intensity can promote the immune system against different infections. It can increment lymphoproliferative replications; increase the number and function of natural killer [NK] cells, and decrement CD4 + T cells to CD8+ T cells ratio.[24] The World Health Organization [WHO] has established clear guidelines on the minimal magnitude of physical activity obligatory to maintain adequate health and fitness.[25] Yoga for breathing techniques [Pranayama], and cogitation [Dhyana], Kapalbhathi have been found subsidiary to purify the frontal air sinuses and withal avail to surmount cough disorders which maintain the health of respiratory tract and boosts immunity.[26]

INFANT FIGHT AGAINST COVID-19 BREAST MILK

Breast milk encloses sundry antimicrobial substances, anti-inflammatory components, and factors that promote the development of the immune system and minimize the occurrence of respiratory tract infections.[19] Breast alimentering and caring for the baby is a sensitive issue to be dealt with in women who are suspected to be or attested to have a coronavirus infection.[27] Breast milk contains antibodies that can fight infection. Breast milk withal is composed of other proteins, fats, sugars, and even white blood cells that work to fight

infection in many different ways. Breast milk has "probiotic" factors, additionally.[28] Breastfeeding has both short and long-term benefits for the mother and her infant. Breast milk with its abundant source of immunoglobulins, lactoferrin, lysozyme, and cytokines plays a consequential role in absorbing and engulfing deleterious micro-organisms and targeting concrete bacteria, and providing auspice by regulating the immune replication.[29]

HYGIENE DURING COVID-19

COVID-19 mothers who are breastfeeding or practicing skin-to-skin contact or kangaroo mother care should practice respiratory hygiene to eschew transmitting the virus to her baby. The room should be isolated, not sanctioning visits of relatives and friends. The baby should be ascertained a two meters safe distance. The mother should wear a face mask during breastfeeds. Lactating mother should wash her hands afore physically contacting any pump or bottle components. If the mother has conspicuous respiratory infection symptoms mother and infant should be transiently dissevered, pending test replication.[29]

Wash hands frequently with soap and dihydrogen monoxide or uses alcohol-predicated hand rub especially afore physically contacting the baby. sneeze or cough into a tissue that has to be disposed of immediately and hands washed again. routinely clean and disinfect surfaces that the mother has physically contacted.[27]

Conclusion

regimes in many countries recommend some preventive measures including staying at home and circumscribing contacts with other people. Vitamin C could play a role in obviating and treating the astringent respiratory viral infection caused by SARS-CoV-2. Nevertheless, it is consequential to apperceive that alimental supplementation will not indispensably obviate infections, or remedy the disease, but may avail decrease symptoms and facilitate recuperation. breast milk is the best source of pabulum for the baby. breastfeeding amends survival and provides perennial health and development advantages to new-borns and infants. Breast milk is a potentially paramount source of antibody aegis for the infants of mothers with COVID-19.

REFERENCE

1. Rozycki, H. J., & Kotecha, S. [2020]. Covid-19 in pregnant women and babies: What pediatricians need to know. *Paediatric Respiratory Reviews*, 35, 31–37. <https://doi.org/10.1016/j.prrv.2020.06.006>
2. Williams, J., Namazova-baranova, L., Weber, M., Vural, M., Mestrovic, J., Carrasco-sanz, A., Breda, J., Berdzuli, N., & Pettoello-mantovani, M. [2020]. The Importance of Continuing Breastfeeding during Coronavirus. *The Journal of Pediatrics*, 223, 234–236. <https://doi.org/10.1016/j.jpeds.2020.05.009>
3. Khanna, K., Kaur, S., Kaur, R., Bhardwaj, A., & Bhardwaj, V. Ohri P., Sharma A., Ahmed A., Bhardwaj, R., Ahmed P., [2020]. Herbal immune-boosters: Substantial warriors of pandemic Covid-19 battle. <https://doi.org/10.1016/j.phymed.2020.153361>
4. World Health Organization. [2020]. Coronavirus. Retrieved from www.who.int

5. Felman Adam, Medical News Today. [February 27,2020]. What to know about coronavirus. Retrived from <https://www.medicalnewstoday.com/articles/256521>,
6. United Nations Children's Fund. [2020]. All you need to know about ideation. Retrieved from <https://www.unicef.org/india/coronavirus/covid-19>
7. Salvatore, C. M., Han, J. Y., Acker, K. P., Tiwari, P., Jin, J., Brandler, M., Cangemi, C., Gordon, L., Parow, A., DiPace, J., & DeLaMora, P. [2020]. Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study. *The Lancet Child and Adolescent Health*, 4[10], 721–727. [https://doi.org/10.1016/S2352-4642\[20\]30235-2](https://doi.org/10.1016/S2352-4642[20]30235-2)
8. Calder, P. C., Carr, A. C., Gombart, A. F., & Eggersdorfer, M. [2020]. Reply to “comment on: Optimal nutritional status for a well-functioning immune system is an important factor to protect against viral infections. nutrients 2020, 12, 1181.” *Nutrients*, 12[8], 1–3. <https://doi.org/10.3390/nu12082326>
9. Gautam S., & Gautam A., Chhetri S., Bhattarai U., [2020] Immunity against COVID-19: Potential role of Ayush Kwath. *Ayurveda Integr Med*, <https://doi.org/10.1016/j.jaim>
10. Strategies, I. [2020]. *Boost the Immune System Boosting Immunity to Prevent COVID*. 1–3.
11. Srivastava, A. [2020]. COVID-19: Herbs That Strengthen Your Immune System. *Outlook Poshan-All About Nutrition*, 3–5. <https://poshan.outlookindia.com/story/poshan-news-covid-19-herbs-that-strengthen-your-immune-system/350819>
12. Busch-Hallen, J., Walters, D., Rowe, S., Chowdhury, A., & Arabi, M. [2020]. Impact of COVID-19 on maternal and child health. *The Lancet Global Health*, 8[10], e1257. [https://doi.org/10.1016/S2214-109X\[20\]30327-2](https://doi.org/10.1016/S2214-109X[20]30327-2)
13. Mothers, L. [2020]. *Impact of COVID-19 on Pregnant Women and Lactating Mothers How can pregnant women protect themselves and others? How can pregnant and lactating women prepare themselves?* 1–10. <https://healthlibrary.askapollo.com/impact-of-covid-19-on-pregnant-women-and-lactating-mothers/>
14. Breastfeeding and COVID-19. [2020]. *Bulletin de l'Académie Nationale de Médecine*. <https://doi.org/10.1016/j.banm.2020.09.030>
15. Hethyshi, R. [2020]. Breast Feeding in Suspected or Confirmed Cases of COVID 19—a New Perspective. *Journal of Obstetrics and Gynecology of India*, 70[4], 267–271. <https://doi.org/10.1007/s13224-020-01336-2>
16. Brief, S. [2020]. *Breastfeeding and COVID-19*. June, 4–9. <https://who.int/news-room/commentaries/detail/breastfeeding-and-covid-19>
17. Henrick, B. M., Yao, X. D., Nasser, L., Roozrogousheh, A., & Rosenthal, K. L. [2017]. Breastfeeding behaviors and the innate immune system of human milk: Working together to protect infants against inflammation, HIV-1, and other infections. *Frontiers in Immunology*, 8[NOV], 1–13. <https://doi.org/10.3389/fimmu.2017.01631>
18. Jackson, K. M., Jackson, K. M., & Nazar, A. M. [2006]. *Breastfeeding , the Immune Response , and Long-term Health*. <https://jaoa.org/article.aspx?articleid=2093315>
19. Chowdhury, A. I. [2020]. Role and Effects of Micronutrients Supplementation in Immune System and SARS-Cov-2 [COVID-19]. *Asian Journal of Immunology*, 4[2], 47–55.
20. Pecora, F., Persico, F., Argentiero, A., Neglia, C., & Esposito, S. [2020]. The role of micronutrients in support of the immune response against viral infections. *Nutrients*,

- 12[10], 1–45. <https://doi.org/10.3390/nu12103198>
21. Junaid, K., Ejaz, H., Abdalla, A. E., Abosalif, K. O. A., Ullah, M. I., Yasmeen, H., Younas, S., Hamam, S. S. M., & Rehman, A. [2020]. Effective immune functions of micronutrients against sars-CoV-2. *Nutrients*, 12[10], 1–14. <https://doi.org/10.3390/nu12102992>
22. Jayawardena R., Sooriyaarachchi P., Chourdakis M., Jeewandara C., Ranasinghe P., [2020]. Enhancing immunity in viral infections, with special emphasis on COVID-19: A review. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews* 14 [2020] 367e382
23. Ak, S., Jp, C., Khan R, Dhand C, & Verma S. [2020]. Role of Medicinal Plants of Traditional Use in Recuperating Devastating Role of Medicinal Plants of Traditional Use in Recuperating Devastating COVID-19 Situation. *Medicinal and Aromatic Plants*, 9[5], 1–16. <https://doi.org/10.35248/2167-0412.20.9.359.Copyright>
24. Moazzen, N., Imani, B., Aelami, M. H., Haghi, N. S. M., Kianifar, H. R., Khoushkhui, M., & Ahanchian, H. [2020]. How to boost your immune system against coronavirus infection? *Archives of Bone and Joint Surgery*, 8[SpecialIssue], 220–225. <https://doi.org/10.22038/abjs.2020.47559.2330>
25. Atre, J. J., Dandekar, S. P., & Ganvir, S. S. [2020]. *Adherence to Physical Activity during COVID-19 Lockdown in India- A Survey. August.*
26. Sharma, K., Anand, A., & Kumar, R. [2020]. The role of Yoga in working from home during the COVID-19 global lockdown. *Work*, 66[4], 731–737. <https://doi.org/10.3233/WOR-203219>
27. Hethyshi, R. [2020]. Breast Feeding in Suspected or Confirmed Cases of COVID 19—a New Perspective. *Journal of Obstetrics and Gynecology of India*, 70[4], 267–271. <https://doi.org/10.1007/s13224-020-01336-2>
28. Mccarthy, B. C. [2020]. *Breastfeeding Benefits Your Baby's Immune System Breast milk: food & infection fighter.* 1–2.
29. Lubbe, W., Botha, E., Niela-vilen, H., & Reimers, P. [2020]. *Breastfeeding during the COVID-19 pandemic – a literature review for clinical practice.* 3, 1–9.