



Integrative Healthcare and Applied Nutrition

IHCAN magazine

HOME LATEST ISSUE DIRECTORY EVENTS

SUBSCRIBE

REFERENCES

A full online archive of references

APRIL 2020

NEWS

Gut Dysbiosis during Influenza Contributes to Pulmonary Pneumococcal Supe

Associations of habitual fish oil supplementation with cardiovascular outcomes and all cause mortality: evidence from a large population based cohort study. Li Zhi-Hao, Zhong Wen-Fang, Liu Simin, Kraus Virginia Byers, Zhang Yu-Jie, Gao Xiang et al. *BMJ* 2020; 368 :m456.

Hypothesis: angiotensin-converting enzyme inhibitors and angiotensin receptor blockers may increase the risk of severe COVID-19, James H Diaz. *Journal of Travel Medicine*, taaa041, <https://doi.org/10.1093/jtm/taaa041>.

NUTRIENT-DEPENDENT – Ben Brown

1. Weiss SR, Navas-Martin S. Coronavirus pathogenesis and the emerging pathogen severe acute respiratory syndrome coronavirus. *Microbiol Mol Biol Rev*. 2005;69(4):635–664.
2. Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J Med Virol*. 2020;92(4):418–423.
3. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation and Treatment Coronavirus (COVID-19). In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2020.
4. Cui J, Li F, Shi ZL. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol*. 2019;17(3):181–192.
5. Quammen D. We Made the Coronavirus Epidemic. New York Times. Jan. 28, 2020.
6. Wu D, Wu T, Liu Q, Yang Z. The SARS-CoV-2 outbreak: what we know [published online ahead of print, 2020 Mar 11]. *Int J Infect Dis*. 2020;S1201-9712(20)30123-5.
7. Lai CC, Liu YH, Wang CY, et al. Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): Facts and myths [published online ahead of print, 2020 Mar 4]. *J Microbiol Immunol Infect*. 2020;S1684-1182(20)30040-2.
8. WHO. Coronavirus disease (COVID-19) Pandemic.

- <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> [accessed 25th March 2020].
9. Mizgerd JP. Acute lower respiratory tract infection. *N Engl J Med.* 2008;358(7):716–727. doi:10.1056/NEJMra074111
 10. Gombart AF, Pierre A, Maggini S. A Review of Micronutrients and the Immune System-Working in Harmony to Reduce the Risk of Infection. *Nutrients.* 2020;12(1):236.
 11. Maggini S, Pierre A, Calder PC. Immune Function and Micronutrient Requirements Change over the Life Course. *Nutrients.* 2018;10(10):1531. Published 2018 Oct 17. doi:10.3390/nu10101531
 12. Childs CE, Calder PC, Miles EA. Diet and Immune Function. *Nutrients.* 2019;11(8):1933. Published 2019 Aug 16. doi:10.3390/nu11081933
 13. Alpert, P. The role of vitamins and minerals on the immune system. *Home Health Care Manag. Pract.* 2017, 29, 199–202.
 14. Hemilä H. Vitamin C and Infections. *Nutrients.* 2017;9(4):339. Published 2017 Mar 29. doi:10.3390/nu9040339
 15. ClinicalTrials.gov Vitamin C Infusion for the Treatment of Severe 2019-nCoV Infected Pneumonia. ClinicalTrials.gov Identifier: NCT04264533 [accessed 25th March 2020].
 16. <https://nypost.com/2020/03/24/new-york-hospitals-treating-coronavirus-patients-with-vitamin-c/>
 17. Cheng R. Successful High-Dose Vitamin C Treatment of Patients with Serious and Critical COVID-19 Infection. Orthomolecular Medicine News Service, Mar 18, 2020
 18. Schleicher RL, Carroll MD, Ford ES, Lacher DA. Serum vitamin C and the prevalence of vitamin C deficiency in the United States: 2003-2004 National Health and Nutrition Examination Survey (NHANES). *Am J Clin Nutr.* 2009;90(5):1252–1263. doi:10.3945/ajcn.2008.27016
 19. Pfeiffer CM, Sternberg MR, Schleicher RL, Rybak ME. Dietary supplement use and smoking are important correlates of biomarkers of water-soluble vitamin status after adjusting

- for sociodemographic and lifestyle variables in a representative sample of U.S. adults. *J Nutr.* 2013;143(6):957S–65S. doi:10.3945/jn.112.173021
20. Hsiao PY, Mitchell DC, Coffman DL, et al. Dietary patterns and diet quality among diverse older adults: the University of Alabama at Birmingham Study of Aging. *J Nutr Health Aging.* 2013;17(1):19–25. doi:10.1007/s12603-012-0082-4
21. Teixeira A, Carrie AS, Genereau T, Herson S, Cherin P. Vitamin C deficiency in elderly hospitalized patients. *Am J Med.* 2001;111:502.
22. Hemilä H, Chalker E. Vitamin C for preventing and treating the common cold. *Cochrane Database Syst Rev.* 2013; (1):CD000980. Published 2013 Jan 31. doi:10.1002/14651858.CD000980.pub4
23. Hemilä H. Vitamin C and Infections. *Nutrients.* 2017;9(4):339. Published 2017 Mar 29. doi:10.3390/nu9040339
24. Hemilä H. Vitamin C and Infections. *Nutrients.* 2017;9(4):339. Published 2017 Mar 29. doi:10.3390/nu9040339
25. Kashiouris MG, L'Heureux M, Cable CA, Fisher BJ, Leichtle SW, Fowler AA. The Emerging Role of Vitamin C as a Treatment for Sepsis. *Nutrients.* 2020;12(2):292. Published 2020 Jan 22. doi:10.3390/nu12020292
26. Padayatty SJ, Sun H, Wang Y, et al. Vitamin C pharmacokinetics: implications for oral and intravenous use. *Ann Intern Med.* 2004;140(7):533–537. doi:10.7326/0003-4819-140-7-200404060-00010
27. Davis JL, Paris HL, Beals JW, et al. Liposomal-encapsulated Ascorbic Acid: Influence on Vitamin C Bioavailability and Capacity to Protect Against Ischemia-Reperfusion Injury. *Nutr Metab Insights.* 2016;9:25–30. Published 2016 Jun 20. doi:10.4137/NMI.S39764
28. Hathcock JN, Azzi A, Blumberg J, et al. Vitamins E and C are safe across a broad range of intakes. *Am J Clin Nutr.*

- 2005;81(4):736–745. doi:10.1093/ajcn/81.4.736
29. Cathcart RF. Vitamin C, titrating to bowel tolerance, anascorbemia, and acute induced scurvy. *Med Hypotheses*. 1981;7(11):1359–1376. doi:10.1016/0306-9877(81)90126-2
30. Read SA, Obeid S, Ahlenstiel C, Ahlenstiel G. The Role of Zinc in Antiviral Immunity. *Adv Nutr*. 2019;10(4):696–710. doi:10.1093/advances/nmz013
31. Singh M, Das RR. Zinc for the common cold. *Cochrane Database Syst Rev*. 2011;(2):CD001364. Published 2011 Feb 16. doi:10.1002/14651858.CD001364.pub3
32. Prasad AS, Beck FW, Bao B, et al. Zinc supplementation decreases incidence of infections in the elderly: effect of zinc on generation of cytokines and oxidative stress. *Am J Clin Nutr*. 2007;85(3):837–844. doi:10.1093/ajcn/85.3.837
33. Barnett JB, Hamer DH, Meydani SN. Low zinc status: a new risk factor for pneumonia in the elderly?. *Nutr Rev*. 2010;68(1):30–37. doi:10.1111/j.1753-4887.2009.00253.x
34. Santos HO, Teixeira FJ, Schoenfeld BJ. Dietary vs. pharmacological doses of zinc: A clinical review [published online ahead of print, 2019 Jul 4]. *Clin Nutr*. 2019;S0261-5614(19)30280-8. doi:10.1016/j.clnu.2019.06.024
35. Cazzola M, Calzetta L, Page C, Rogliani P, Matera MG. Thiol-Based Drugs in Pulmonary Medicine: Much More than Mucolytics. *Trends Pharmacol Sci*. 2019;40(7):452–463. doi:10.1016/j.tips.2019.04.015
36. Hui DS, Lee N, Chan PK, Beigel JH. The role of adjuvant immunomodulatory agents for treatment of severe influenza. *Antiviral Res*. 2018;150:202–216. doi:10.1016/j.antiviral.2018.01.002
37. Mata M, Morcillo E, Gimeno C, Cortijo J. N-acetyl-L-cysteine (NAC) inhibit mucin synthesis and pro-inflammatory mediators in alveolar type II epithelial cells infected with influenza virus A and B and with respiratory syncytial virus (RSV). *Biochem Pharmacol*. 2011;82(5):548–555. doi:10.1016/j.bcp.2011.05.014

38. Mata M, Sarrion I, Armengot M, et al. Respiratory syncytial virus inhibits ciliogenesis in differentiated normal human bronchial epithelial cells: effectiveness of N-acetylcysteine. *PLoS One.* 2012;7(10):e48037. doi:10.1371/journal.pone.0048037
39. De Flora S, Grassi C, Carati L. Attenuation of influenza-like symptomatology and improvement of cell-mediated immunity with long-term N-acetylcysteine treatment. *Eur Respir J.* 1997;10(7):1535–1541. doi:10.1183/09031936.97.10071535
40. Rasmussen JB, Glennow C. Reduction in days of illness after long-term treatment with N-acetylcysteine controlled-release tablets in patients with chronic bronchitis. *Eur Respir J.* 1988;1(4):351–355.
41. Zhang Q, Ju Y, Ma Y, Wang T. N-acetylcysteine improves oxidative stress and inflammatory response in patients with community acquired pneumonia: A randomized controlled trial. *Medicine (Baltimore).* 2018;97(45):e13087. doi:10.1097/MD.00000000000013087
42. Lai KY, Ng WY, Osburga Chan PK, Wong KF, Cheng F. High-dose N-acetylcysteine therapy for novel H1N1 influenza pneumonia. *Ann Intern Med.* 2010;152(10):687–688. doi:10.7326/0003-4819-152-10-201005180-00017
43. Dodd S, Dean O, Copolov DL, Malhi GS, Berk M. N-acetylcysteine for antioxidant therapy: pharmacology and clinical utility. *Expert Opin Biol Ther.* 2008;8(12):1955–1962. doi:10.1517/14728220802517901
44. Molnár Z, Shearer E, Lowe D. N-Acetylcysteine treatment to prevent the progression of multisystem organ failure: a prospective, randomized, placebo-controlled study. *Crit Care Med.* 1999;27(6):1100–1104. doi:10.1097/00003246-199906000-00028
45. Kleinvelde HA, Demacker PN, Stalenhoef AF. Failure of N-acetylcysteine to reduce low-density lipoprotein oxidizability in healthy subjects. *Eur J Clin Pharmacol.* 1992;43(6):639–642.

- doi:10.1007/bf02284964
46. Imdad A.; Mayo-Wilson E.; Herzer K.; Bhutta Z.A. Vitamin A supplementation for preventing morbidity and mortality in children from six months to five years of age. *Cochrane Database Syst. Rev.* 2017; 3, CD008524.
47. Mathew JL. Vitamin A supplementation for prophylaxis or therapy in childhood pneumonia: a systematic review of randomized controlled trials. *Indian Pediatr.* 2010;47(3):255–261. doi:10.1007/s13312-010-0042-1
48. Thorne-Lyman A, Fawzi WW. Vitamin A supplementation, infectious disease and child mortality: a summary of the evidence. *Nestle Nutr Inst Workshop Ser.* 2012;70:79–90. doi:10.1159/000337445
49. Chen H, Zhuo Q, Yuan W, Wang J, Wu T. Vitamin A for preventing acute lower respiratory tract infections in children up to seven years of age. *Cochrane Database Syst Rev.* 2008; (1):CD006090. Published 2008 Jan 23. doi:10.1002/14651858.CD006090.pub2
50. Grotto I, Mimouni M, Gdalevich M, Mimouni D. Vitamin A supplementation and childhood morbidity from diarrhea and respiratory infections: a meta-analysis. *J Pediatr.* 2003;142(3):297–304. doi:10.1067/mpd.2003.116
51. Friedman A, Sklan D. Antigen-specific immune response impairment in the chick as influence by dietary vitamin A. *Journal of Nutrition* 1989;119:790-5.
52. Friedman A, Meidovsky A, Leitner G, Sklan D. Decreased resistance and immune response to *Escherichia coli* infection in chicks with low or high intakes of vitamin A. *Journal of Nutrition* 1991;121:395-400.
53. Fortes C, Forastiere F, Agabiti N, et al. The effect of zinc and vitamin A supplementation on immune response in an older population. *J Am Geriatr Soc.* 1998;46(1):19–26. doi:10.1111/j.1532-5415.1998.tb01008.x
54. Griffiths JK. The vitamin A paradox. *J Pediatr.* 2000;137(5):604–607.

55. Carr AC, Maggini S. Vitamin C and Immune Function. *Nutrients*. 2017;9(11):1211.
56. Hemilä H. Vitamin C and the common cold. *Br J Nutr*. 1992;67(1):3–16.
57. Hemilä H. Vitamin C intake and susceptibility to pneumonia. *Pediatr Infect Dis J*. 1997;16(9):836–837.
58. Hemilä H. Vitamin C and Infections. *Nutrients*. 2017;9(4):339.
59. Ghezzi P. Role of glutathione in immunity and inflammation in the lung. *Int J Gen Med*. 2011;4:105–113.
60. Hui DS, Lee N, Chan PK, Beigel JH. The role of adjuvant immunomodulatory agents for treatment of severe influenza. *Antiviral Res*. 2018;150:202–216.
61. De Flora S, Grassi C, Carati L. Attenuation of influenza-like symptomatology and improvement of cell-mediated immunity with long-term N-acetylcysteine treatment. *Eur Respir J*. 1997;10(7):1535–1541.
62. Read SA, Obeid S, Ahlenstiel C, Ahlenstiel G. The Role of Zinc in Antiviral Immunity. *Adv Nutr*. 2019;10(4):696–710.
63. Singh M, Das RR. Zinc for the common cold. *Cochrane Database Syst Rev*. 2013;(6):CD001364.

ALLERGY and IMMUNITY

Breadth of concomitant immune responses prior to patient recovery: a case report of non-severe COVID-19. Thevarajan, I., Nguyen, T.H.O., Koutsakos, M. et al. *Nat Med* (2020).
<https://doi.org/10.1038/s41591-020-0819-2>

Published 16 March 2020. DOI:
<https://doi.org/10.1038/s41591-020-0819-2>