

The Case for a Nutrient Based Approach to Building Immunity in Fighting Coronaviruses: A Poly Vagal Perspective.

By: Nicole Keane, MS BCTMB LMT, Updated 3/28/20

Coronaviruses such as COVID -19, SARS, and MERS, are aggressive and deadly in human populations.

Coronaviruses are known to originate, evolve, and incubate in bat populations. Coronavirus mortality in other mammals, such as humans, is much higher than that of bats. A bat's Poly Vagal system is likely much more robust than other mammal's due to the evolutionary characteristics associated with their ability to use echo location. This ability uses muscle contractions, and activation of motor neurons within the Poly Vagal system, specifically those of the middle ear, larynx, and nasal passages¹.

Bats have a higher vagal tone due to the effects of their nervous system being attenuated by their practice of echo location. Vagal tone can be increased by activation of the motor neurons of the vagal branches associated with auditory and laryngeal muscle contractions². This higher vagal tone results in significantly lower inflammation levels that facilitate the process of coronaviruses, and viruses like Ebola, to rapidly replicate and achieve more virulence in their evolution. Moreover, even with the high metabolism that bats have, this evolutionary feature allows them to live exponentially longer than other mammals their size, possibly due to their immune and nervous systems continuously suppressing inflammation. When viruses that originate in bats, jump into human populations, they are met with less robust immune systems, comparatively; immune systems with more inflammation and less vagal tone, causing high mortality rates and aggressive transmission of pandemic proportion.³

By increasing vagal tone in human populations, we may be able to control the mortality rates and transmission of coronaviruses through society. We must find methods that increase vagal tone, promote a healthy level of immune activation, and continuously decrease in inflammation levels through the course of infection with coronavirus in a human host. I propose ways that this may be achieved such as:

Lifestyle Changes⁴:

- ◆ Being in a continuous state of Gratitude, through a Gratitude practice that is given attention several times per day. Make a list and take it out when you are feeling times of fear or panic.
 - “When we are in a state of Gratitude, we are bathed in cues of safety.” - Dr. Stephen Porges
- ◆ Group Singing
- ◆ Rhythmic breathing exercises, focusing on extending the out breath (only if not actively in acute respiratory infection phase).

Supplementation:

- ◆ Increase dopamine to bolster Ventral Vagal tone in thorax to decrease inflammation.
 - Vitamin C ⁵(Taken 30 min before food preventative: 1000 mg per day, acute infection:1000 mg 3x per day)
- ◆ Increasing ability to produce and replace Myelin to help bolster the Ventral Vagal circuit, helping reduce inflammation in the thorax and system wide.
 - Adequate levels of:
 - Vitamin B12 ⁶ (recommend 2.5g methylcobalamin inter muscular injection for preventative and acute infection for people with very low levels of B12; 2.5 mg oral per day thereafter)
 - L-Serine ⁷ (preventative 500 mg per day during times of stress; acute infection 500 mg 2x per day)
 - Vitamins D⁸ (1k -5k IU for prevention in winter months, depending on need, 10K IU per day for

1 Van Ryckegham, Alain. “How Do Bats Echolocate and How Are They Adapted to This Activity?” *Scientific American*, Scientific American, 21 Dec. 1998, www.scientificamerican.com/article/how-do-bats-echolocate-an/.

2 Porges, Stephen W. *The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication, and Self-Regulation*. New York: W.W. Norton, 2011. Print.

3 University of California - Berkeley. "Coronavirus outbreak raises question: Why are bat viruses so deadly? Bats' fierce immune systems drive viruses to higher virulence, making them deadlier in humans." *ScienceDaily*. ScienceDaily, 10 February 2020. <www.sciencedaily.com/releases/2020/02/20200210144854.htm>.

4 Porges, Stephen W. *The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication, and Self-Regulation*. New York: W.W. Norton, 2011. Print.

5 Harrison, Fiona E, and James M May. “Vitamin C function in the brain: vital role of the ascorbate transporter SVCT2.” *Free radical biology & medicine* vol. 46,6 (2009): 719-30. doi:10.1016/j.freeradbiomed.2008.12.018

6 Miller A, Korem M, Almog R, Galboiz Y. Vitamin B12, demyelination, remyelination and repair in multiple sclerosis. *Journal of the Neurological Sciences*. 2005 Jun;233(1-2):93-97. DOI: 10.1016/j.jns.2005.03.009.

7 Morell P, Quarles RH. Characteristic Composition of Myelin. In: Siegel GJ, Agranoff BW, Albers RW, et al., editors. *Basic Neurochemistry: Molecular, Cellular and Medical Aspects*. 6th edition. Philadelphia: Lippincott-Raven; 1999.

8 Matías-Guío J, Oreja-Guevara C, Matías-Guío JA, Gomez-Pinedo U. Vitamin D y remielinización en la esclerosis múltiple. *Neurología*.

- acute infection for 2-3 weeks, monitor for hypercalcemia) taken with ghee or coconut oil
- Vitamin A (10k once a week for prevention; carefully monitor and increase for active infection) taken with ghee or coconut oil
- Vitamin K^{9 10} (90 mcg) taken with ghee or coconut oil
- ◆ Decreasing mast cell activation and cytokine storm.
 - Cimetidine/ Tagamet¹¹ – Acts on H2 histamine receptors to curb mast cell degranulation. Recommended for acute infection.
 - Silymarin/Milk Thistle^{12 13} – Helps with liver cell regeneration and mast cell inflammatory response.
 - Quercetin¹⁴ (Taken 30 min before food, Preventative: 500 mg per day; acute Infection: 500 mg 2x per day)
- ◆ Increase the resilience of the Autonomic nervous system in lungs and thorax by decreasing inflammation and increasing lung function.¹⁵
 - NAC^{16 17 18} (N- Acetyl Cysteine (preventative 600 mg, 2x per day; acute therapy: 1200 mg, 3x per day)
- ◆ Increase Acetylcholine (ACH) to help decrease neuroinflammatory response.
 - Ginseng^{19 20} - (preventative: 500 mg per day; acute infection: 500 mg 2-3x per day)
 - Another option: Gotu Kola²¹ - (preventative: 700 mg per day; acute infection: 700 mg 2x per day)
 - Note: Monitor patient for adverse reaction after several days of supplementation, and decrease if experiencing dizziness, upset stomach, digestive problems, sleep disturbance, GERD symptoms, any other vagal mediated adverse reactions. ACH has a “sweet spot” and often the symptoms of low ACH are very similar to high ACH.²²
- ◆ Throat Spray with Echinacea and propolis.

Possibly Effective Therapeutic Interventions:

- ◆ Visceral and Neural manipulations that affect the Poly Vagal system. Experience of the practitioner and familiarity with Autonomic nervous system regulation, and Poly Vagal Theory, is critical for efficacy.
 - Visceral Manipulation of the:
 - Bronchus, Lungs, Liver, Spleen, Upper Cardiac area, and Thymus.
 - Fascial Release of the clavicular area to allow for lymph flow from the cranium.
 - Neural manipulation and Cranial Osteopathic techniques to affect the:
 - Brain Stem C1-C4, Medulla, Hypothalamic Nuclei, Pineal, Pituitary, Carotid sheath, Vagus nerve from cranium to Esophagus, and Stellate Ganglion.
 - Safe and Sound Listening Protocol (SSP), Developed by Dr. Stephen Porges.

Note: Although Selenium is a powerful antioxidant that has a beneficial effect on the nervous system, it is not recommended in this paper, because I feel it is very easy to take too much and go into a state of toxicity. Selenium can best be taken in from food such as broccoli or blending garlic cloves with the skin on. All vitamin and supplement recommendations should be implemented with the knowledge of your

2018;33:177–186.

9 Schwalfenberg, Gerry Kurt. “Vitamins K1 and K2: The Emerging Group of Vitamins Required for Human Health.” *Journal of nutrition and metabolism* vol. 2017 (2017): 6254836. doi:10.1155/2017/6254836

10 Popescu, Daniela C et al. “Vitamin K enhances the production of brain sulfatides during remyelination.” *PLoS one* vol. 13,8 e0203057. 27 Aug. 2018, doi:10.1371/journal.pone.0203057

11 Molderings, Gerhard J et al. “Pharmacological treatment options for mast cell activation disease.” *Naunyn-Schmiedeberg's archives of pharmacology* vol. 389,7 (2016): 671-94. doi:10.1007/s00210-016-1247-1

12 Kim, Beom-Rak et al. “Silibinin inhibits the production of pro-inflammatory cytokines through inhibition of NF-κB signaling pathway in HMC-1 human mast cells.” *Inflammation research : official journal of the European Histamine Research Society ... [et al.]* vol. 62,11 (2013): 941-50. doi:10.1007/s00011-013-0640-1

13 Lovelace, Erica S et al. “Silymarin Suppresses Cellular Inflammation By Inducing Reparative Stress Signaling.” *Journal of natural products* vol. 78,8 (2015): 1990-2000. doi:10.1021/acs.jnatprod.5b00288

14 Weng, Zuyi et al. “Quercetin is more effective than cromolyn in blocking human mast cell cytokine release and inhibits contact dermatitis and photosensitivity in humans.” *PLoS one* vol. 7,3 (2012): e33805. doi:10.1371/journal.pone.0033805

15 Dekhuijzen, P N R, and W J C van Beurden. “The role for N-acetylcysteine in the management of COPD.” *International journal of chronic obstructive pulmonary disease* vol. 1,2 (2006): 99-106. doi:10.2147/copd.2006.1.2.99

16 Ungheri D, Pisani C, Sanson G, et al. Protective effect of n-acetylcysteine in a model of influenza infection in mice. *International Journal of Immunopathology and Pharmacology*. 2000 Sep-Dec;13(3):123-128.

17 Otu, Akaninyene et al. “Nebulised N-Acetylcysteine for Unresponsive Bronchial Obstruction in Allergic Bronchopulmonary Aspergillosis: A Case Series and Review of the Literature.” *Journal of fungi (Basel, Switzerland)* vol. 4,4 117. 15 Oct. 2018, doi:10.3390/jof4040117

18 Luigino Calzetta, Paola Rogliani, Francesco Facciolo, Barbara Rinaldi, Mario Cazzola, Maria Gabriella Matera, N-Acetyl cysteine protects human bronchi by modulating the release of neurokinin A in an ex vivo model of COPD exacerbation, *Biomedicine & Pharmacotherapy*, Volume 103, 2018, Pages 1-8

19 Lee, Mi Ra et al. “Chronic dietary ginseng extract administration ameliorates antioxidant and cholinergic systems in the brains of aged mice.” *Journal of ginseng research* vol. 41,4 (2017): 615-619. doi:10.1016/j.jgr.2017.06.002

20 Su, Chih-Fen et al. “Increase of acetylcholine release by Panax ginseng root enhances insulin secretion in Wistar rats.” *Neuroscience Letters* 412 (2007): 101-104.

21 Gohil, Kashmira J et al. “Pharmacological Review on Centella asiatica: A Potential Herbal Cure-all.” *Indian journal of pharmaceutical sciences* vol. 72,5 (2010): 546-56. doi:10.4103/0250-474X.78519

22 Hudson, James B. “Applications of the phytomedicine Echinacea purpurea (Purple Cone flower) in infectious diseases.” *Journal of biomedicine & biotechnology* vol. 2012 (2012): 769896. doi:10.1155/2012/769896

primary care physician, as some things may interact with pharmaceuticals and not be appropriate for everyone.