Infarct Combat Project

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Covid-19: Treating Cause and Effects

"Autonomic Dysfunction, the Immune System and Lactic Acidosis"

*by Carlos ETB Monteiro**

Covid-19 and the central nervous system

- Presentation of a global portrait of some of the most prevalent or emerging human respiratory viruses that have been associated with possible pathogenic processes in Central Nervous System infection, with a special emphasis on human coronaviruses. [1]
- Review about the research into neurological complications in Cov infections and the possible mechanisms of damage to the nervous system. [2]
- Patients with COVID-19 commonly have neurologic manifestations. Compared with patients with non-severe infection, patients with severe infection were older, and had more underlying disorders. [3]
- Increasing evidence shows that coronaviruses are not always confined to the respiratory tract and that they may also invade the central nervous system inducing neurological diseases. [4]

Covid-19 and the Autonomic Nervous System

- Svtetlana Blitshteyn, MD, said in recent article:
  "While there is no data on how COVID-19 affects individuals with autoimmune and/or autonomic disorders, we can hypothesize how they would respond to COVID-19 based on their response to the flu. My personal opinion is that patients with these disorders should be viewed as high risk population…." [5]
- During the 2020 Congress from the European Academy of Neurology the Scientific Panel for Autonomic Nervous System (ANS) Disorders, stated:
  "Autonomic disorders, or their treatment, may place the patient at a greater risk of contracting infections or of a more severe course." [6]
- Autonomic dysfunction has been reported in retrovirus (human immunodeficiency virus (HIV), human T-lymphotropic virus), herpes viruses, flavivirus, enterovirus 71 and lyssavirus infections. Autonomic dysfunction may be responsible for additional morbidity in some infectious diseases [7]

Autonomic Nervous System and the Immune System

- Both sympathetic and parasympathetic arms of the autonomic nervous system are instrumental in orchestrating the neuroimmune processes. [8]

Covid-19 and the Immune System

- The immune response is essential to control and eliminate CoV infections, however, maladjusted immune responses may result in immunopathology and impaired pulmonary gas exchange. [9]

Lactic acidosis and Immune System

- Lactate has been shown to regulate immune responses during infections. Its reduction may start the immune response (27,28]

Lactic acidosis and Coagulation in Covid-19

- It was observed that the most common laboratory abnormalities were depressed total lymphocytes, prolonged prothrombin time, and elevated lactate dehydrogenase. [10]
- The coagulation function in patients with SARS-CoV-2 is significantly deranged compared with healthy people [11]. However, lactic acidosis remarkably impairs the coagulation system. [12]

Fighting Covid-19

Our view

- Old people and patients with chronic diseases pose a large risk for Covid-19. However, in all patients infected with Covid-19, we should fight both the virus as well to prevent or solve the autonomic nervous dysfunction, the weakened immune system, and to reduce the production of lactic acid in the body.

The solution:

Cardiac glycosides: For autonomic dysfunction, lactic acidosis, and the immune system

- The right drugs to fight the autonomic nervous dysfunction and lactic acidosis are digoxin, digitoxin and other cardiac glycosides, at daily low concentration doses, because these attends both situations. [13-15]
- Cardiac glycosides may also strengthen the innate immune system [16]

Cardiac Glycosides: Potential drugs to fight Covid-19

- Studies demonstrated potential positive effects from digoxin and other cardiac glycosides as antivirals, including for Covid-19 [17-20].
- Also, it has been shown that viruses that target lung epithelial cells are severely impaired by cardiac glycosides". [21]

Vitamin C and D are also helpful for Covid-19

- Acute administration of Vitamin C at high doses improves baroreflex sensitivity and vagal sinus modulation. Consequently, it influences the stabilization of the autonomic function. [22,23] Vitamin C may also contribute to immune defense by supporting various cellular functions of both the innate and adaptive immune system. [24]
- A recent study elucidates the potential therapeutic role of Vitamin D for autonomic dysfunction. According this study Vitamin D is a neuroactive hormone that modulates

autonomic balance, regulating the sympathetic and parasympathetic nervous systems, and has multisystem benefits. [25] Vitamin D can also modulate the innate and adaptive immune responses. [26]

Suggested reading

For more information read our book "Autonomic Dysfunction + Lactic Acidosis = Multiple Diseases". Particularly the page 6 on the 'Look Inside" that is free of charge until page 17. This book was published by Amazon.com at https://amzn.to/3fkhvH0

Additional information related to the present article:

1) "Covid-19: Treatment by Cardiac glycosides: Theoretical Approaches" at www.infarctcombat.org/Covid-19.TheoreticalApproaches.pdf

2) "Covid-19: Acute Respiratory Syndrome Coronavirus, Central Nervous System, Autonomic Nervous System, Lactate and Cardiac Glycosides" at www.infarctcombat.org/Covid-19.ARS.CNS.ANS.LDH.pdf

3) "Other Anti-Viral Mechanisms Proposed for Cardiac Glycosides" at www.infarctcombat.org/CardiacGlycosides-Antiviral.Mechanisms.pdf

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[HOME / INDEX]