

COVID-19 Long Haulers and COVID-19 Vaccination

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Received: March 20, 2021; **Published:** April 16, 2021

Quotation: *"Perhaps if individuals were vaccinated, there would be a decrease in the number of long hauler patients".*

We are now starting to observe numerous individuals who suffer from "lingering damage" resulting from individuals who had COVID-19 Infections [1,2]. These individuals have been term "Long Haulers". Studies from investigators at the CDC found that these Long Hauler patients did not go back to their normal levels of health after two weeks [1,2].

What has been noted among the Long Hauler patients is that many of these individuals were not tested when they first became ill with COVID-19 because of the fact that in those early days testing was not yet available to them. In other case scenarios these Long Haulers were not given timely testing because they did not manifest symptoms that would have qualified them for testing [1,2].

An interesting finding involving the Long Haulers was the fact that when these individuals were finally tested, they had been in the COVID-19 disease process for many weeks or months and that they had at that point in time tested negative [1,2]. Sadly, these Long Hauler Individuals who had not been tested because of the delays in the testing process, did indeed manifest the same kinds of symptoms as individuals who have been tested in a timely manner [1,2].

Investigations have noted that the majority of COVID-19 patients produced antibodies that remained present for many months [1-3]. These investigations were confined to patients who were hospitalized. What is quite interesting is that many of the Long Hauler Patients who were tested for COVID-19 tested negative for this virus despite that fact that they manifested symptoms which were consistent for Coronavirus COVID-19 infection [1,2].

Reports have been coming in from many different parts of the world on patients who had had lingering symptoms after their viral carriage PCR tests were negative [1,2]. These symptoms involved: a) heart abnormalities, b) gastrointestinal problems, c) extreme fatigue, d) bulging veins, e) excessive bruising, f) short term memory loss, g) gynecological problems, h) sensitivity to light and sounds, i) and brain fog [1,2].

A term that is being put forth to describe the kinds of symptoms that Long Haulers experience is the term "*dysautonomia*" [1,2]. This term connotes maladies in which there is a disturbance of the autonomic nervous system. The questions that then arise are: a) is this damage due to the COVID-19 virus, or b) has the damage resulted from an intense immune response mounted by the body against the virus [1,2].

What is coming to light as relates to patients (i.e. Long Haulers) is that there needs to be changes to the current definition of "recovery from COVID-19" progress beyond being released from the hospital or having a negative test for the carriage of virus [3].

In the United States as of March 2021, there were three vaccines that have been authorized, namely: a) the Pfizer BioNTech COVID-19 Vaccine, b) the Moderna COVID-19. Vaccine, and c) the Johnson and Johnson COVID-19 Vaccine [4]. The Pfizer-BioNTech COVID-19 Vaccine, and the Modern COVID-19 Vaccines are messenger RNA Vaccines. The Johnson and Johnson is a vector Vaccine [4].

The messenger RNA Vaccine preps have been given in two doses at the interval of 21 days for the Pfizer-BioNTech Vaccine Prep and 28 days for the Moderna Vaccine Prep. The Johnson and Johnson Vaccine Prep is given as a single dose [4].

A messenger RNA based vaccine will bring about a scenario in which a RNA in the form of a lipid nanoparticle is introduced in a tissue. In this situation, the artificially introduced RNA behaves like messenger RNA (for artificial creation of COVID-19 spike proteins), which in turn cause the recipient cells to create a COVID spike protein which in return causes the cell to produce an “adaptive immune response” to this spike protein [4]. This adaptive immune response subsequently educates cells to identify and thus destroy the COVID-19 pathogen [4].

In a Vector Vaccine Preparation, an artificial “non-replicating viral vector (not able to synthesize new viral particles) is utilized [4]. In this vector vaccine preparation it is DNA rather than messenger RNA that is utilized in the form of an adenoviral shell”. The DNA contained in this viral shell contains the codes for the SARS-COV-2 protein. The Johnson and Johnson Vaccine Prep utilizes a non-replicating viral vector which brings about an immune response against the COVID-19 virus.

The Pfizer Vaccine must be stored at -70°C, whereas the Moderna Vaccine can be stored at -20°C (temperature of a domestic freezer compartment). The advantage of the Moderna Vaccine is that it can be used in suburban or rural areas which do not have ultra low -70°C freezer units.

The Johnson and Johnson Vaccine Prep has the ability to be stored in the refrigerator unit of a domestic refrigerator which 4°C.

Wetsman mentioned an interesting theory as relates to the long haulers, namely, that perhaps the immune systems in these Long Hauler individuals failed to completely destroy the COVID-19 virus in the initial stages of infection [5]. These individuals may be considered as being “no longer” infectious but it could be possible that these persons could still carry pieces of the COVID-19 virus or viral nucleic acid fragments which still remain in their bodies, and thus cause damage [5].

If the presence of remaining pieces of COVID-19 virus or viral nucleic acid fragments is the *raison d’être* for the existence of Long Hauler individuals, then perhaps if these patients were vaccinated, there would be a decrease in the number of patients [5].

The recent literature is starting to report the positive effects of COVID-19 Vaccines on Long Hauler Patients [6].

A recent personal communication from a colleague in a local medical center, noted that 30 - 50 percent of their Long Hauler patients responded favorably after having received a COVID-19 Vaccine [7].

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Volume 10 Issue 5 May 2021

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