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Editorial

Immune Competency and the Cascade of COVID-19 Events

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COVID-19, once obtained, is with an individual forever. For many, the symptoms are persistent. It is also confirmed by various health organizations worldwide that fifty (50) percent of those infected are asymptomatic but still capable of infecting others. Also now known is that fifty (50) percent of cases of COVID-19 (Coronavirus disease-2019) has been caught from asymptomatic individuals. COVID-19 is the disease caused by the SARS CoV-2 virus. SARS-CoV-2 is Severe Acute Respiratory Syndrome Coronavirus 2. It is an RNA (ribonucleic protein) type of virus.

Viruses are tiny agents made of DNA (deoxyribonucleic acid) or RNA (ribonucleic acid) which contain a protein coat including a lipid or fat envelope (outer layer) and replicate inside living host cells in the body. They replicate by entering and utilizing the host cell synthesis system for continued existence and replication. RNA viruses are much more virulent and difficult to contain because they mutate to newer forms rapidly. Importantly, coronaviruses are widespread among bird and mammals with bats being host to the largest variety of different types of coronavirus genetic (gene) makeup.

Humans have experienced seven (7) different coronavirus types through the ages. Four of these coronavirus types are responsible for 20% of common colds according to the United States Center for Disease Control (CDC). More recent coronaviruses to impact humans were the SARS-CoV severe acute respiratory syndrome which surfaced in China in 2002, the MERS-CoV Middle East respiratory syndrome outbreak in 2012, which occurred through contact with camels and the current SARS CoV2 pandemic which started in China in 2019. These last three coronaviruses have been caused by "horseshoe" bat virus transmitted to humans through different animal sources. The "horseshoe" bats get their name from large nose-leafs, which are shaped like horseshoes, and aid in echolocation or detection of prey in areas of high environmental clutters. They prefer to reside in damp, dark places such as caves, building basements or home attics. The SARS CoV virus was transferred from horseshoe bats to the Chinese pangolin, also known as the scaly anteater, and then through direct contact to humans. It has been one of the most trafficked mammals in the world (particularly in Asia) for its delicacy as a meat including its skin and scales which are used in traditional medicine.

COVID-19 transmission of aerosolized microspores between humans, through direct contact, allows docking of these aerosolized droplets onto specific ACE2 (angiotensin-converting enzyme 2) receptors (cells) in the mouth, nose and eyes and then invades these same type receptors in the brain, lungs, heart and blood vessels, liver, kidney and gastrointestinal tract. ACE2 has as its primary function in the body to lower blood pressure. It is now known that the multi-organ (panorgan) danger in humans with wide-spread blood vessel pathology, caused by this COVID-19 virus and impact on ACE2, can yield significant challenges including death, particularly in older individuals with compromised immune systems and respiratory inefficiency through blood vessel dyscrasias.

Infection and recovery with people who have tested positive for the virus is complex to access and still totally undefined. Researchers have concluded that incubation periods of the virus is 2 - 14 days with a median of 7 days. Viral load appears to peak 5 - 6 days after symptoms start but people are infectious before the symptoms show. Further complicating the slowing of the virus spreading is this COVID-19 virus is up to 4 times more likely to reproduce and infect people in contrast to the common flu, influenza. This virus spreading reproduc-

tive number is defined by how many other people one infected person infects. Influenza has been defined and known through studies to have a R Naught reproductive number or rate of 1.3. COVID-19 can be as high as 6.

For those individuals who manifest symptoms, the United States Center for Disease Control (the CDC) has indicated these symptoms can include fever, cough, shortness of breath or difficulty in breathing, loss of taste or smell, chills, repeated shaking with chills, muscle pain, headache and sore throat. COVID-19 confuses the immune system.

It was originally thought that children do not transmit the disease to the same extent as adults. In actuality, based upon a large research study in Korea with 65,000 people, children until 10 years old do transmit (half as much) as adults. With worldwide research occurring, an Italian study found that children with asthma and allergies were protected from COVID-19. This is apparently due to reduced ACE2 expression or activity in children. This finding may teach opportunities for treatments in other individuals by managing ACE2 activity through medication.

Treatments now being evaluated worldwide include the use of convalescent plasma from recovered patients into ill patients (antibodies support), use of antiviral medications (with limited success), monoconal antibodies (which block the small protein chemical messengers (cytokines) that control inflammation) and can cause cytokine "storms" or overreaction of the body's immune system and lastly, traditional anti-inflammatory medications like the steroid dexamethasone which blocks inflammation.

Today because of the worldwide spread of COVID-19, international cooperation between many countries has lead to the development of over 30 different vaccines. The World Health Organization (WHO) indicates fifteen (15) have begun clinical trials in humans. A US newspaper, The New York Times, through its research, understands that some nearly 90 preclinical vaccines are currently being tested in animals for subsequent introduction into humans. In the United States where clinical trials are underway, an important and necessary component of the double blind studies to support success, is that a minimum of 150 cases in each study must be confirmed as failures with no prevention of COVID-19 for comparison to those showing positive success with the vaccine. Also, The United States Center for Disease Control has initiated an 18-month study of 25,000 individuals who have had the disease and others who have not, to determine who has antibodies to offer and do people have immunity from reinfection due to these antibodies in their system?

The four types of vaccines which are currently being developed include: Virus Vaccines (which use weakened or inactivated coronavirus), Viral Vector Vaccines (genetically engineered to provide coronavirus proteins), Nucleic Acid Vaccines (DNA or RNA coded to adjust the replication of the coronavirus through penetration into the coronavirus protein cell) and finally Protein Vaccines which are virus like particles or protein subunits that attack a portion of the coronavirus (known as the "spike" protein outer section of the coronavirus spore) and stop the replication. Although not vaccine, please keep in mind that various plant foods, with direct immune-enhancing abilities, are also widely available to increase immune competency.

The coronavirus map today, as tabulated by The New York Times, indicates as of September 9, 2020, there are 27.6 million active cases of COVID-19 with nearly 900,000 deaths worldwide. In the US alone, there have been 189,000 deaths with approximately 680,000 confirmed cases.

When will this pandemic begin to slow? Different healthcare organizations using prediction model outcomes dependent upon how people interact, suggest it may be years for this COVID-19 pandemic disease to be contained.

Does everyone already have the virus in their body? Probably…and it will be with the individual forever.

Be Well!

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