Dr. Delgado COVID-19 Update 09-17-20

Genomics Update

A forthcoming study from 23andMe shows that a person's genetic code could be connected to how likely they are to catch Covid-19 — and how severely they could experience the disease if they catch it. It's an important confirmation of work published earlier this summer in the New England Journal of Medicine (NEJM) on the subject.

People whose blood group is O seemed to test positive for Covid-19 less often than expected when compared to people with any other blood group. Also, according to 23andMe's data, people who tested positive and had a specific variant of another gene also seemed to be more likely to have serious respiratory symptoms.

The previous NEJM study demographics only included people with severe Covid-19 symptoms, was limited by the number of samples collected for genomic analysis and was drawn from patients in Spain and Italy thereby limiting racial diversity.

The 23andMe study was able to address some of these limitations and this appears to have allowed them to draw stronger conclusions. First, it included both mild and severe cases. Second, 23andMe has an obvious

advantage — it has already sequenced more that 12 million peoples genomic sequences, according to the company's website and over a million people agreed to participate in the company's Covid-19 study. Lastly, the representation of Latinos and Blacks in the study is vital with those populations being disproportionately impacted by the virus.

Both studies suggested one gene found in that area on chromosome three — SLC6A20 — might be particularly related to worse outcomes; however, it's not yet clear how a particular gene could make a meaningful difference.

Without a clearer understanding of which genes matter — and more importantly why — the impact of genetic studies on Covid-19 treatment plans will be limited. What is the factor or clinical manifestation, in relation to a Covid-19 infection, that these genetic associations contribute to susceptibility or outcomes?

These findings don't yet offer real world or practical implications. There are still no treatment decisions to be elucidated from the data, but they may shed a light as to where further avenues of research may lie.

Will Covid-19 be seasonal?

Scientists don't know for sure why these viruses follow a

seasonal pattern, but a number of factors are thought to play a role. For example, studies suggest that many respiratory viruses are more stable and linger in the air longer in environments with cold temperatures and low humidity.

Early studies on Covid-19 also suggested that the virus's transmission may increase in colder temperatures and decrease in warmer temperatures. This appears to have not held as the infections have continued unabated during these summer months.

But with any infectious disease, in order for cases to decline, a factor known as the "basic reproduction number" (R0) or the average number of people who catch the virus from a single infected person, needs to drop below 1.

The R0 for COVID-19 appears to be relatively high, with most calculations estimating a value between 2 and 3, compared with about 1.3 for the flu. COVID-19's high R0 may be due, in part, to the absence of pre-existing immunity to the disease in most of the population. Thus, with a higher R0, it likely portends that it will be harder to push the R0 below 1. This suggests that it will be more difficult to achieve herd immunity.

As more people gain immunity, either through natural

infection or vaccine, the R0 is expected to drop substantially. When a COVID-19 vaccine becomes available, it may reduce the spread, but it will likely not totally eliminate the virus. That's because the vaccine will not be 100% effective, so some infections will still occur. In addition, the protection offered by the vaccine may wane with time, or the virus may mutate and evade immune protection.

Will our immunity hold?

The bad news is that viruses that infect via the mucous membranes of the nose and throat, like Covid-19, typically don't induce permanent or "one-and-done" immunity. Some people might develop permanent immunity, but it will not be the norm.

In addition, immunity either through infection or a vaccine, may protect that individual from re-infection, but not from their ability to harbor the virus if re-exposed and still transmit it to others. That is because immunity likely will not block the virus from replicating in the upper airways, but only from progression to systemic disease in individuals. The current Phase 3 trial should further clarify this specific issue.

The most likely scenario is that people whose immune systems have been primed to recognize and fight the virus

— whether through infection or vaccination — could contract it again in the future. But these infections would be cut short as the immune system's defenses kick into gear. In addition, previous studies with other coronaviruses show that in those that become reinfected, the period of virus shedding was shorter and their symptoms were much milder or even absent.

So far, the evidence supports this form of immunity, but the only way to see how long that will last is to follow people over time and see if those responses diminish. The presumption is that your antibodies will wane, but your memory responses or T-cell immunity aren't absent. When a primed immune system then re-encounters the virus, production of antibodies would likely kick into gear.

This type of protection, if it comes to pass, will exist on the individual level. There will likely remain pockets of people who have never been infected and who haven't been vaccinated. If they contract the virus, we should still see significant disease.

To Further Clarify

A meta-analysis is a quantitative, formal, epidemiological study design used to systematically assess multiple research studies to derive conclusions about that body of research on a specific subject. Outcomes from a meta

analysis may include a more precise estimate of the effect of treatments or risk factors for disease, or other outcomes, than any individual study contributing to the pooled analysis. The benefits of meta-analysis include a consolidated and quantitative review of a large, and often complex, sometimes apparently conflicting, body of literature.

A recent meta-analysis published in the Travel Med Infectious Disease Journal included 21 previous studies regarding the effectiveness of masks in reducing transmission of respiratory viruses. The analysis showed that the use of masks provided a significant protective effect as to the spread of respiratory viruses and also in contracting them.

Use of masks by healthcare workers (HCWs) and non healthcare workers (Non-HCWs) can reduce the risk of respiratory virus infection by 80% and 47%, respectively. Masks had a clear protective effect in reducing the transmission and contraction against both influenza and Covid-19.

Please continue to remain vigilant as to the use of facial masks. Also, continue with proper social distancing and to practice regular hand hygiene.

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