

Prevention Risks of Post Covid-19 Infection and Rebound Symptoms

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General overview of Covid-19

The novel coronavirus of 2019 has been present among us for decades, mainly confined to cattle and livestock where it is harmless and up until the end of 2019, did not infect human cells. Once it did, it produced a combination of mild to severe manifestations that guaranteed its spread across the globe. The combination of aerosol transmission alongside barely detectable and nonspecific symptoms allowed it to spread unmanageable. Finally, the ultimate onslaught of respiratory distress in a small proportion of unfortunate individuals solidified its deadliness. By the time a decent understanding of the situation was achieved, it's already too late to contain it.

Measured on a comparable scale only by the 1918 outbreak of the Spanish Flu, Covid-19 caught us off guard and humankind scrambled to keep up with it ever since. As of writing this article, a cumulative total of 6.31 million people has lost their lives directly to Covid-19 since the start of 2020 [1]. This monumental number however, does not represent those who died indirectly from the effects of Covid-19 on their physical, mental and emotional health. That death toll is termed "excessive mortality", at approximately 14.9 million people between 1st January 2020 and 31st December 2021 as per

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the WHO (World, 2022). Almost 15 million deaths from Covid-19 and only 42% of them attributable to direct Covid-19 infection.

Due to small lifespans of micro-organisms, they often undergo an accelerated evolution, which in the case of Covid-19 has produced many variants. From Alpha to Beta to Gamma to Delta and Omicron to the current dynamic duo of Delta Cron (combination of Delta and Omicron) and subvariants of Omicron

labelled BA.2 and BA.4, the virus continues to evolve and test our best medical interventions time and time again. As of May of 2022 first, strain of BA.5 were detected in South Africa which are sub-lineages of Omicron. Proportions of the BA.5 have also been observed in Portugal.

To counter disease severity and limit spread, vaccines were invented across the globe. The 1st and 2nd generations of vaccines used inactivated or live-attenuated viral particles and viral protein subunit vaccines respectively. They have now been succeeded by the 3rd generation comprising DNA and RNA vaccines [2]. Unsurprisingly, Covid-19 vaccines also suffered from 'Anti-vax' sentiments. Anti-vax has been around since the 18th century and the historic older brothers of Covid-19, such as the IPV and MMR vaccines also underwent the same reception [3].

Statistics however, have favored vaccination. The UK saw consistently lower Age Standardized Mortality Rates (ASMR) for vaccinated people versus their unvaccinated counterparts across all age ranges [4]. Similarly, the CDC also noted lower incidence and severity of Covid-19 among partially and fully vaccinated individuals over unvaccinated ones [5]. However, vaccination in of itself does not fully solve the problem otherwise the excess mortality numbers wouldn't be 58% of the total deaths caused directly and indirectly by Covid-19. Therefore, still a long way to go towards effectively putting the Covid-19 era behind us and one step on that road deals with life after recovering from a Covid-19 infection.

Post-covid complications

Because the pathogenesis of Covid-19 has been all but certain throughout the pandemic was only beginning to see the long-term effects of Covid-19. Cases have shown long term complications of our physical and mental health. Knowledge of the possible outcomes of recovery from Covid-19 is as important as having the Covid-19 vaccine. Surviving the illness does not bestow permanent immunity to another infection or to the complications of Covid-19 that outlast the disease itself.

Long Covid-19

A person can still have lingering effects of Covid-19 even after full recovery from the initial infection. This persistence of deleterious effects long after resolution of the coronavirus from our systems is termed as Long Covid-19 Syndrome, or Long Covid for short. First gaining recognition among social support groups and making its way towards scientific literature, Long Covid can affect survivors regardless of severity of initial Covid-19 infection.

Clear definitions of Long Covid are still under debate but the common symptoms of Long Covid appear to be fatigue and shortness of breath persisting weeks and even months after recovery from the initial illness [6]. Possible etiologies have been theorized including long term damage of the lungs and brain. This has led to the emergence of system-wide adverse outcomes that are not tissue-localized, such as Rheumatoid Arthritis, Kawasaki Disease, Myocardial Infarctions, Lupus, Epilepsy and more [7].

Lung fibrosis

Because Covid-19 predominantly has been a respiratory illness with rapid progression of lung damage, fibrosis of the affected lung tissue has been an expected long-term complication of Covid-19. Molecular progression to lung fibrosis is still unclear at the moment. However, researchers believe it to be a multifactorial occurrence, suggesting that those with more severe initial illnesses either due to waning immunity protection or presence of risk factors like smoking, previous lung damage, pneumonias, obesity, diabetes or heart disease tend to have a higher risk of long term lung scarring, leading to advanced lung fibrosis and Covid-19 Interstitial Lung Disease or PC-ILD [8].

One possible mechanism was proposed by Delpino et al. in 2020 whereby dysregulation of Renin and Angiotensin could contribute to lung fibrosis via increasing levels of Transforming Growth Factor β (TGF- β) leading to activation of myofibroblasts in pulmonary systems [9].

Vaccine induced disease

Covid-19 vaccines still remain one of our best chances against acquiring a severe and potentially lethal bout of the illness. However, vaccination in of itself is not the one-all-be-all of Covid-19. Vaccination also carries risks of symptoms, most of which do not last beyond a week. Most common symptoms of vaccination include malaise, muscle ache at the site of vaccine administration, low grade fever and fatigue. Another category of vaccine-related-conditions is attributable to the vaccine itself.

Depending on the vaccine used among other factors, people can still develop diseases attributable to the vaccine. One such entity is Vaccine Induced Myocarditis and Pericarditis, a usually self-limiting but sometimes therapy-necessitating inflammation of the heart muscle or the pericardium. Although mostly self-limiting, occasional cases of myocarditis/pericarditis require treatment with steroid medication [10].

Expert recommendations

Re-infections and post-Covid-19 complications are a reality that cannot be dismissed if it could reduce the excessive mortality figures going forward. A number of recommendations are made by the CDC to ensure measurable reductions in the likelihood of acquiring another Covid-19 infection [11]. Whether first timers or Covid-19 survivors, the recommendations remain the same.

Get vaccinated

Vaccines may not be perfect, but they are still our best bet against acquiring a severe Covid-19 infection going forward. Overall efficacies of each of the available vaccine types are comparable, so any brand of the available vaccines can be availed. It is important to note that full vaccination (with booster) is the way to go as being partially vaccinated does not provide the full measure of protection afforded by the vaccine. Boosters are equally important because the immunity provided by Covid-19 vaccines is all but permanent, and the waning immunity status mandates regular booster shots until a sizeable number

of the population has been vaccinated. All must be aware of possible side effects of vaccine induced symptoms and available treatments. Physician consultation is highly recommended to monitor prior to receiving Covid-19 boosters so you may be educated on adverse side effects and risks considering current medical conditions and any potential drug interactions be it medical therapy or recreational drugs. Patient monitoring through the vaccination process is recommended.

Social distancing and face masks

Non-pharmacological methods of preventing Covid-19 like wearing a well-fitting face mask, frequently washing hands, standing 6-feet away from each other and avoiding places with overcrowding or suboptimal ventilation are still recommended by the CDC.

These are simple measures that reduce the likelihood of transmission of Covid-19 by aerosol or by surface transmission. Coupled with vaccination, these measures remain our strongest defense against future Covid-19 infections.

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Consultation with doctor

For cases involving severe symptoms such as chest pain, shortness of breath, high grade fever and alteration of taste and smell, prompt consultation with your doctor is advised so that any vaccine induced conditions can be dealt with as soon as they surface. If the initial Covid-19 infection was moderate to severe, or there are pre-existing health issues that may get exacerbated as part of Long Covid-19 Syndrome, regular follow up consultation with your responsible physician are also recommended.

Conclusion

Covid-19 may be a temporary condition with varying severity. However, survivors of Covid-19 are far from being free of the illness forever, as the initial attack of the disease may have had long lasting effects on our body systems predisposing us to Long Covid-19, increased risk of re-infections and more. It is just as important to stay vigilant and adopt protective and preventive strategies after surviving Covid-19 as it was during the pandemic.

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