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Covid-19 Pandemic and Vaccine Prospect: Lessons Learnt from HIV/AIDS

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ABSTRACT

Recent media reported in India that weeks after first vaccine dose during the trial, a Minister got Covid-19. It may have hogged the headline in regard to India's covaxin produced by Bharat Biotech. The company, however, soon issued a statement defending itself. Experts opined that like all viruses, coronaviruses are crackers of expert code and caused a pandemic in large part because it operated on three of our most human vulnerabilities; our biological safeguards, clustering patterns of our social behaviour and out simmering ideological differences. How will the confrontation unfold in the next years and decades? No one can say. This paper explores the several lessons from the long battle with HIV, the human immunodeficiency virus that causes AIDS, suggest what may lie ahead. HIV is one of the worst diseases faced by humans.

Keywords: Covid-19; Covaxin; HIV; AIDS

VACCINE PROSPECT

The Pfizer BioNTech vaccine administered recently in UK caused serious allergic reactions among two individuals, who had reported history of reactions to other allergens as British media among others reported. Similarly, the study results, published in the British medical journal Lancet on AstraZeneca vaccine, answered many questions but not all, especially how efficacious the vaccine works on people above 55 years of age, a crucial group prone to developing complications and to succumb to the infection. Researchers caution against making head-to-head comparisons of vaccines on the basis of incomplete data. The disparity in the latest results means there will be considerable uncertainty over precisely how well the vaccine protects against COVID-19 until ongoing efficacy trials report more data, say scientists. There are currently more than 50 Covid-19 vaccine candidates as WHO site indicates. Covax Advance Market Commitment mechanism has also been developed by WHO that aims to support the participation of 92 lower-middle and low-income economies in Covax facility.

Experts opined that like all viruses, coronaviruses are crackers of expert code and certainly has shattered humans. Think of this virus as an intelligent biological machine constantly running DNA experiments to adapt to the ecological niche it resides in. This virus has caused a pandemic in large part because it operated on three of our most human vulnerabilities; our biological safeguards, clustering patterns of our social behavior and out simmering ideological differences.

How will the confrontation unfold in the next years and decades? No one can say. But several lessons from the long battle with HIV, the human immunodeficiency virus that causes AIDS, suggest what may lie ahead. HIV is one of the worst diseases faced by humans. As a code cracker, the specialist is HIV. The global death toll from this epidemic at the end of 2019 was about 33 million individuals. Yet one must appreciate what our scientific defenses have accomplished. Of the nearly 38 million people living with HIV/AIDS at present, 25 million are undergoing antiretroviral therapies that prevent and suppress the virus so well they are unlikely to pass it along.

Doctors, virologists, epidemiologists and public health specialists have gained valuable lessons that can be applied to the ongoing pandemic battle, from the fights against this epic war against HIV/AIDS. It has been noted, for example, that vaccines are never a guarantee but that treatments may be most significant tool. It has been found that human behavior plays a crucial role in any attempt to combat disease, and that human nature should not be ignored. It has also been shown how critical it is to build on knowledge and tools gained fighting earlier outbreaks a strategy only possible if research funding flow in between pandemics.

Early observations of how HIV behaves in our bodies showed that the road to a vaccine would be long and challenging. As the outbreak unfolded, experts began tracking antibody levels and T cells (the white blood cells that wage war against invaders) in those infected. The high levels of both showed that patients were mounting incredibly active immune responses, more forceful than anything seen for any other disease. But even working at its highest capacity, the body's immune system was never strong enough to

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clear out the virus completely. Unlike the "hit-and-run" polio virus, which evokes long-term immunity after an infection, HIV is a "catch it and keep it" virus if one is infected, the pathogen stays in the body until it destroys the immune system, leaving the individual undefended against even mild infections. Moreover, HIV continually evolves a shrewd opponent seeking ways to elude human immune responses. Although this does not mean a vaccine is impossible, it certainly meant developing one, especially when the virus hit in the 1980s, would not be easy. Unfortunately, no one can predict with certainty that an AIDS vaccine can ever be made any time soon, even though globally various research programs are going on.

The path to a SARS-CoV-2 vaccine may be filled with trials and errors, even though Oxford University's AstraZeneca; Pfizer's BioNTech, American Company's Novavax also partnered By Serum Institute of India, Russia Gemaleya University's Sputnik are reportedly ready after passing the trial phases; and India's Covaxin, among others, are in the final stages. Research studies found that some people with COVID-19 make neutralizing antibodies that can clear the virus, not everybody does. Scientists pointed out that whether a vaccine will stimulate such antibodies in everyone is still unknown. Moreover, it is not known how long those antibodies can protect someone from infection. It may be two or three years before we will have the data to tell us and any confidence in the outcome. Interestingly, thirty thousand volunteers around the world participated in networks built by the National Institutes of Health for studies of new HIV vaccine candidates, and these networks are being tapped for initial testing of COVID-19 vaccines, too.

In the case of HIV infected cases, when doctors treated a HIV patient, who is likely to die, they were willing to risk with the drug that might sicken the patient but still save their life. But doctors are less willing to do that to prevent disease, as the chances of causing harm to the patient are too high. This is why for decades the quest for a vaccine to prevent HIV infection has lagged so far behind development of therapeutic drugs for HIV. However, the drugs used then, now stand as an incredible success story. The first set of HIV drugs were nucleic acid inhibitors, known as chain terminator drugs. By the 1990s world had gotten better at using combinations of drugs to control HIV infections soon after patients were exposed. The next set of drugs was protease inhibitors. The gold standard for AIDS treatment now is called antiretroviral therapy essentially patients take a cocktail of at least three different drugs that attack the HIV virus in different ways. Today an infection is far from the death sentence it used to be patients can now live almost unaffected by HIV, with a relatively minimal impact on life expectancy. Notably, many of the drugs used in treatment of HIV patients; are currently being administered successfully to treat SARS Cov2 infected patients, as well.

In trying to understand and counter the AIDS epidemic, medical experts and social scientists have found that human behavior modification, especially among young adults, as the prime tool to prevent HIV infection. Consequently, the behavior change communication took the center-stage of preventive intervention to fight HIV/AIDS globally; and it has been a success story. The same behavior modification approaches, as- know your risk, know your partners and take necessary precautions apply today to COVID-19. Many young people operate under the false assumption that even if they become infected, they will not become severely ill. Not only is this belief untrue, but even people with asymptomatic infections can suffer serious, lasting damage. Thus, more the people understand the risk younger people especially the greater likelihood they will take the steps necessary to protect themselves and others; through wearing of mask, hand hygiene and social distancing in public spaces. We saw this happen with HIV/AIDS through consistent condom use, safer injecting practices and through proper screening for blood transfusion.

Citizens around the globe are just beginning to glimpse what the long-term toll of COVID-19 might be. This is a new virus, so clearer idea will not emerge until after a few years. Humans have been here before, confronting an unknown viral adversary, and one can rely on the lessons that one has learned. Science, the very edge of human awareness, leaps into the darkness. That is where we start, as if we are in a cave, chipping away at hard stone wall. One does not know what one will find on the other side. We may be in for a protracted pandemic, or we may soon be lucky with successful treatments and vaccines, as positive developments seem to be in the horizon [1-10].

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