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Drugs under Study for Covid-19 Treatment

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Commentary

As of May, 2020, 31 individual drugs were suggested for treatment of COVID-19. None is proven to be effective as of now. Viruses growth is unlike a bacteria, parasite or fungi. Viruses uses our cells as host, then convert them into its "own home base" to replicate more of its copies at a faster rate. This is unlike bacteria, parasite, fungi where for example antibacterial drugs can work to disrupt the ability of bacteria, parasite or fungi to grow by inhibiting the utilization of nutrients or disrupt its cells. Most antiviral drugs interfere with interaction of viral DNA or RNA with host cell. Over 300 agents are used in the field of Infectious Disease, under more than 29,000 trade names worldwide. The drugs currently proposed against corona virus are essentially agents that are already used to treat other viral diseases such as HIV, Influenza.

Initial results suggest that those, which are administered in clinical practice (Oseltamivir, Zanamivir, Ganciclovir, Acyclovir), are not effective against COVID-19. Others which have been suggested include Galidesivir, Interferon alpha, Interferon beta, Lopinavir, Remdesivir, Ritonavir, Sofusbuvir, Telbivudine, Tenofovir. Recently, it is seen that those drugs which were used for Ebola treatment like- Remdisivir and used for HIV- Lopinavir have been seem to have some effect against corona virus.

The effects of drugs are not based only on their mechanism of action. They are also determined by the immune system of the individual and how the body reacts to the virus. The poorer the immune system, the higher the body's reaction, and higher the chances of critical inflammation, organ failure and death. Individual's body reaction determines the degree of complications in corona virus.

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Angiotensin Converting Enzyme (ACE) inhibitor is an vital factor in this process. ACE is present in the heart, kidneys, lungs. ACE inhibits Renin-Angiotensin (RAS) system which is associated with disruption of blood vessels, triggering of clotting factors, and leads to inflammation, as body's own protective mechanism. These cellular processes lead to release of cytokines, which increases the amount of White Blood Cells, which are body's soldier cells against any infection or pathogen. Such cells destroys the pathogen in normal cases. It is important to note that when corona virus invades the body, it binds to ACE in the human cell, leading to disruption of all of the above sequential processes. Therefore, in recent weeks COVID-19 treatment is aimed on those drugs which interrupts virus attachment to cells , or alter the immune response of the body against the virus. Recent reports suggest that Hydroxychloroquine, a drug used in the treatment of malaria and certain inflammatory diseases is effective in controlling these processes. Colchicine, Metronidazole, Sarilumab, Teicoplanin, and Tocilizumab may act through similar mechanisms. Many publications have also examined the use of traditional Chinese medicines and serum obtained from patients who had recovered from COVID-19. The use or effect of Ayurvedic medications is yet to be examined.

The underline issue is how best scientists, policy makers and government can facilitate development and release of drugs for COVID-19. The processes of clinical trials, committee approval, studies in humans, licensing are time consuming. An expedited approach is crucially needed since many of these drugs under consideration are already licensed for use in other diseases.

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