OPEN ACCESS Freely available online

Journal of Clinical Trials

Editorial

Research Progress and Challenges to Coronavirus Vaccine Development

Merry D*

Department of Clinical Trials Transformation Initiative, Duke University, USA

SUMMARY

The pandemic COVID-19 occurring due to novel emerging coronavirus-2019 (SARS-CoV-2) is severely affecting the worldwide public health, culture, economy and human social behaviour. Till date, there is no approved medicine/treatment to cure COVID-19, whereas, vaccine development efforts are going on high priority. This review aimed to provide an overview of prior art, recent advances, vaccine designing strategies, current scenario, opportunities and challenges related to development of coronavirus vaccine.

The SARS-CoV-2 resembles the SARS-CoV in several aspects. Homology modeling revealed that both the viruses employ similar receptor-binding domains to attach to the host cells with subtle differences in particular amino acid residues.The coronaviruses have spike proteins that are glycoproteins and consist of two subunits: S1 and S2. The S1 and S2 proteins are the most important structural proteins of the virus. The spikes on the surface of the SARS-CoV-2 are homotrimers of S proteins that establish attachments with the host cell receptors.The structural and the non-structural proteins (nsps) in co-ordination carry out the CoV pathogenesis and decide the virulence. spreading should are more vaccinated. However, women working with the public/ with children, and people with children living reception, weren't more vaccinated than women at low risk of exposition and disease-spreading. An accumulation of mononuclear cells suspected to be monocytes and T cells was observed in the lungs of a COVID-19 patient along with decreased systemic levels of hyperactive T cells. Lymphopenia and decreased levels of peripheral T cells indicate that the T cells are migrated toward the lungs from the systemic circulation to the site of infection (primarily lungs) to counteract the viral infection.

ANTIGEN PRESENTATION

To date, there are no reported studies on the immune mechanism of SARS-CoV-2 infection. However, the studies on the immune mechanisms of the related viruses like SARS-CoV and MERS give much insight into the immune mechanism of the virus. 10 Upon entry into the host, the virus presents its antigens to the antigen-presenting cells.

HUMORAL AND CELLULAR IMMUNITY

Antigen presentation by the APCs results in the activation of the cell-mediated and the humoral immunity of the host governed by T cells and B cells, respectively. The antibody response (levels of IgM and IgG) to SARS-CoV follows a characteristic pattern. The IgM antibody levels reach undetectable levels by the end of 12th week of infection, but the IgG remains for more extended periods.

CONCLUSION

However, several vaccine agents designed against SARS-CoV resulted in immunopathology due to TH2 cell-mediated infiltration of eosinophils. The vaccinated mice showed increased immunopathology than protection against SARS-CoV infection. 32 Therefore, further extensive studies are needed to evaluate the protective versus damaging T cell responses, which is essential for designing vaccines for the coronavirus However, it is very important to investigate whether T cell-mediated responses are solely responsible for infection control in humans. This will provide impetus to the vaccine development process.

Correspondence to: Merry David, Department of Clinical Trials Transformation Initiative, Duke University, USA, E-mail: merry@david.com

Received date: October 26, 2020; **Accepted date:** November 11, 2020; **Published date:** November 19, 2020

Citation: Merry D (2020) Research Progress and Challenges to Coronavirus Vaccine Development. J Clin Trials. S8:e001