Development of SARS-CoV-2 Vaccine: Challenges and Prospects

ABSTRACT

The WHO declared coronavirus disease 2019 (COVID-19) a pandemic in March 2020, which was caused by novel coronavirus severe acute respiratory coronavirus 2 (SARS-CoV-2). SARS-CoV-2 made its first entry into the world in November 2019, and the first case was detected in Wuhan, China. Mutations in the SARS-CoV-2 genome distressed life in almost every discipline by the extended production of novel viral variants. In this article, authorized SARS-CoV-2 vaccines including mRNA vaccines, DNA vaccines, subunit vaccines, inactivated virus vaccines, viral vector vaccine, live attenuated virus vaccines and mix and match vaccines will be discussed based on their mechanism, administration, storage, stability, safety and efficacy. The information was collected from various journals via electronic searches including PubMed, Science Direct, Google Scholar and the WHO platform. This review article includes a brief summary on the pathophysiology, epidemiology, mutant variants and management strategies related to COVID-19. Due to the continuous production and unsatisfactory understanding of novel variants of SARS-CoV-2, it is important to design an effective vaccine along with long-lasting protection against variant strains by eliminating the gaps through practical and theoretical knowledge. Consequently, it is mandatory to update the literature through previous and ongoing trials of vaccines tested among various ethnicities and age groups to gain a better insight into management strategies and combat complications associated with upcoming novel variants of SARS-CoV-2.