Summary of Emergency Use Authorization Application Materials for Pfizer-BioNTech COVID-19 Vaccine

Dec. 9, 2020

On Nov. 20, Pfizer and BioNTech submitted an Emergency Use Authorization (EUA) application for a COVID-19 investigational vaccine (BNT162b2). FDA has provided a briefing document to the Vaccines and Related Biological Products Advisory Committee (VRBPAC) that summarizes the data provided in the EUA application. The document is intended to inform the meeting of the VRBPAC, which will convene to discuss the application and provide recommendations on whether:

- Based on the totality of scientific evidence available, it is reasonable to believe that the Pfizer-BioNTech COVID-19 vaccine may be effective in preventing COVID-19 in individuals 16 years of age and older.
- The known and potential benefits of the Pfizer-BioNTech COVID-19 vaccine outweigh its known and potential risks for use in individuals 16 years of age and older.

Background

The Pfizer-BioNTech vaccine is based on a SARS-CoV-2 spike glycoprotein (S) antigen encoded by RNA formulated in lipid nanoparticles (LNPs). The vaccine has completed phases 1, 2, and 3 randomized clinical trials of approximately 44,000 participants that received the vaccine or placebo. The vaccine is recommended for persons over 16 years of age and is given in two doses, 21 days apart. Study participants were randomized to receive either the vaccine or placebo with a median of two months follow-up after the second dose.

Safety and Side Effects Summary

- The study demonstrates the vaccine was safe and well-tolerated in participants ≥16 years of age.
- Reactogenicity and adverse events were generally milder and less frequent in older participants (≥56 years of age) compared with the younger group (≤55 years of age). Reactogenicity was considered mostly mild to moderate and short-lived, and the adverse events profile did not suggest any serious safety concerns.
- There is a significant occurrence of side effects, including injection site reactions (84.1%), fatigue (62.9%), headache (55.1%), muscle pain (38.3%), chills (31.9%), joint pain (23.6%), and fever (14.2%). Median onset of symptoms is 0-2 days after vaccination and duration was 1-2 days.
- There were four cases of Bell's palsy in the vaccine group, which is not outside the parameters of the general population, but is something to watch.
- A total of six people died during the study period: four in the placebo and two in the vaccination group (heart attack and arteriosclerosis). All deaths were determined not to be vaccine/study related.
- Pregnant and breastfeeding women were not included in the study. FDA and Pfizer are not able to make any recommendations for use of the vaccine in these populations.

Efficacy Summary

- Study results show the vaccine provided protection against COVID-19 in participants who had no evidence of prior infection, with more severe cases observed in the placebo group.
- The vaccine was >90% effective in preventing confirmed COVID-19 occurring at least seven days after the second dose.
- The vaccine shows some protection after the first dose, but the study does not validate that it can be administered as one dose.
- There is a slight decrease in vaccine efficacy in older populations, but not a significant change.
- The vaccine is effective across gender, race and ethnicity demographics, and persons with comorbidities. However, there were not enough racial minorities enrolled in the study to make specific statements about the vaccine effectiveness broken down by race/ethnicity.
- There is limited data surrounding the vaccine efficacy against asymptomatic disease and transmission.

Next Steps

FDA will review the data to determine if the known and potential benefits outweigh the risks of vaccination before issuing an EUA. An EUA will authorize use, but not approve the vaccine. Pfizer will undergo further investigation until it is licensed under a Biologics License Application. Should an EUA be issued, Pfizer plans to unblind study participants upon request to provide the vaccine to persons in the placebo group. Participants will be followed for two years. The VRBPAC will meet on Dec. 10 to review and evaluate data concerning the safety, effectiveness, and appropriate use of the Pfizer-BioNTech vaccine. Please refer to the briefing document for further information.