

[mRNA vaccines are they effective against the Covid-19 virus in US veterans.]

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[Vaccinations have been proven to be effective against many diseases including the covid-19 virus. This paper aims to look at the effectiveness of follow-up booster shots specifically in US veterans. The reason for this specific population is that this specific version of the vaccine has not been tested among a diverse population and the US veteran population is a great place to start. This research is important because of the relevance of the covid 19 virus and its ever-adapting strains so having a new booster that is effective against this new strain is vital. The exciting progress that has been made in this field recently is the development of the covid vaccine as mRNA was vital in its production and laid the groundwork for many future mRNA vaccines to come. There are some problems with this field as mRNA vaccines are a very new and under-researched field so any problems that it may have may not come to light until future research is done.]

Introduction

[this study was conducted in hope of better understanding the effect of mRNA boosters specifically in US veterans. With the recent outbreak of the covid 19 virus any defense that can better protect the population is one that should be investigated. mRNA has been in research for years ever since its discovery in the 1960s. (1) After its discovery it was examined in labs until it was able to be synthesized and tested on lab rats as part of a cancer vaccine trial. It was only recently they were released for human use. MRNA vaccines are created using a nearly identical process to how our body naturally replicates DNA except for a spiked protein to

create the correct chain of nucleotide bases. (1) This allows the vaccine to work without a live version of the disease in the vaccine. The mRNA version teaches the cell to make proteins to fight it. mRNA vaccines are a groundbreaking discovery that was first released publicly for the Pfizer and Moderna vaccines during the height of the covid outbreak. mRNA is the future of vaccine technology as mRNA itself has been researched for years and the possibilities it contains are nearly endless. But can these different versions of mRNA vaccines be made and if so, which are going to be more effective? This is what this paper aims to answer when

comparing the mRNA-1273 vaccine and the BNT162b2 vaccine.]

Recent Progress

[The recent progress this field has made is fully working mRNA vaccines. Before this recent covid-19 outbreak the mRNA, of the vaccine was only in clinical trials. This already tested data was vital to create the first version of the covid vaccine that possibly saved lives. In the study Comparative effectiveness of third doses of mRNA-based COVID-19 vaccines in US veterans they found that the third dose of the mRNA vaccines is effective in the US veteran population. This mRNA vaccine was tested during the period when the delta and omicron variants were the dominant variants. (2) According to their data it reduced the number of hospitalizations from covid 19 over 16 weeks. in people of all ages. It was also found that an mRNA-based booster specifically mRNA-1273 was 13 percent more effective in preventing an infection from the covid 19 virus than the BNT162b2. (2) Over 9 weeks of Omicron-variant predominance, the estimated risk of documented SARS-CoV-2 infection (covid 19) was also higher with a third dose of the BNT162b2 vaccine than with a third dose of the mRNA-1273 vaccine; the estimated risk ratio was 1.57 (1.12, 2.10) and the estimated risk difference, expressed as events over 9 weeks per 10,000 persons, was 63.2 (15.2, 100.7) (2) they credit this to the amount of mRNA in each vaccine mRNA-1273 (50 µg for booster doses, 100 µg for third primary doses) compared with of BNT162b2 (30 µg for booster and third primary doses). As well as being more effective mRNA vaccines are much safer because they do not contain live versions of the virus. Because of this, these vaccines can be made in bulk because they are not required to grow new bacteria to put into each vaccine. Because they do not rely on the disease itself for the vaccine to work but instead use proteins these vaccines can be easily changed. (3) This can help with things like drug resistance virus strains or slightly different

variants. The future of mRNA vaccines is a very bright one. Because with enough research these vaccines can be adapted to any kind of disease or ailment. Meaning there is a possible cure for a plethora of diseases in mRNA as well as terminal diseases. (1) These vaccines can teach the body to fight for itself in a way regular DNA vaccines could not.]

Discussion

[Looking at these data points this study had a few strong parts that back up the data found. One is that the VA database used was very rich in medical history and demographics allowing a wide variety of people to be tested. Second is the large population that was tested this allowed for uncommon circumstances to present themselves and see how they are affected such examples being hospitalization ICU visits and death from covid 19. While this study does have some great points that boost the results of this study some weak points can take away from their research. The one possible negative point they discussed in their study is when they are comparing different types of mRNA vaccines. They say there could be differences based on different risk factors for the outcomes mentioned above. (2) Saying that the results could be different based on the criteria of risk factors you use in your study. They emphasize that more testing is needed to truly understand the effectiveness of the mRNA vaccines. Even with this negative point, the results of this study remain valid that these boosters are indeed effective in the veteran population. There are a few questions still left unanswered by this data that can be used in future studies. Is there another mRNA vaccine that is more effective than the two discussed in the Comparative effectiveness of third doses of mRNA-based COVID-19 vaccines in the US veterans journal? What effect could mRNA vaccines have on other illnesses like the Flu, HIV, or even tuberculosis? Finally, what else is mRNA capable of what other kind of impact can it have on the world of medicine?]

References

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