

The Pros and Cons of Moderna Vaccine, the COVID-19 Vaccine – a Survey Based Study

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Abstract

Introduction: During emergency situation of COVID-19 pandemic Moderna vaccines was authorized by food and drug administration under emergency use authorization (EUA) this survey manifests different peoples opinion and their experience upon Moderna vaccination **Objective:** This survey was carried out to find out the pros and cons of the vaccination carried out for COVID-19 by Moderna vaccine. **Method:** In the preparation of this survey based article we made google form and set questions related to Moderna vaccine and individual opinion on it, distributed to 100 participants and gather all material we have searched WHO guidelines and study EUA fact sheet provide by FDA go read different articles included google scholar ,Pub med, Science Direct , ELSEVIER, ResearchGate etc. **Results:** Based on the survey article, Moderna vaccine has been proven safe and effective against SARS-COVID-2. The vaccine was recommended to apply on 18 or above years of aged persons. It shows immunity for at least 119 days after the first vaccination and is 94.5% effective however. Some of the vaccinated persons found to be associated with allergic symptoms such as Covid arm, fever, muscle pain, tiredness and chills. However, no severe adverse effect of this vaccine has still been reported. **Conclusion:** It has been concluded that the Moderna vaccine is perfectly safe and effective against the COVID-19 pandemic. The vaccine is also found to be more potent with only a few side effects such as swelling and pain at the administration side only.

Keywords: Moderna , vaccine, advantage, covid 19, google scholar

Introduction

Coronavirus disease of 2019 (COVID-19) is disease that is extremely contagious that creates disturbance in world's health and its economy. SARS-CoV-2 is a new virus related to the similar family of viruses such as severe acute respiratory syndrome (SARS) and some kind of common cold. SARS-CoV-2 is a specific virus that can cause COVID-19, a disease, which is challenging and life threatening caused pandemic globally (Organization, 2021).

SAR-CoV-2 is spreading consistently every day and becoming a reason of increasing mortality rate. After December 25, 2020 WHO stated that COVID-19 had affected 80,161,578, 00 people and 216 countries. When there is no any other specific treatment or vaccination for this virus so this virus is speedily spreading worldwide and people are facing lots of health care challenges with stress, anxiety, also facing lockdown problems during this COVID-19 pandemic. During this pandemic many vaccines were developed and this vaccination step is the most meaningful tool in opposition to SARSCoV-2 (Wei, Fishman, Wattenberg, Gordon, & Lebwohl, 2021).

mRNA-1273 Vaccine

During emergency situation of COVID-19 pandemic Moderna vaccine was authorized by food and drug administration under Emergency Use Authorization (EUA). To benefit the human health care Moderna vaccines were developed quickly and fight against many cases of SARS-CoV-2 (Livingston, 2021).

In laboratories mRNA can be synthesized and injected to the cell which can produce protein species into the cell. An immune reaction is developed after these protein species leaves the cell. Moderna vaccine is mRNA-1273 vaccine and it uses this method to vaccinate individuals against COVID-19 infection.

General Information

This vaccine that uses new mRNA technology is available in multi dose vial having 5 ml dispersion which is for 10 vaccine of 0.5 ml each (Meo, Bukhari, Akram, Meo, & Klonoff, 2021).

Moderna vaccine contains active and inactive ingredient including mRNA, DSPC, lipid, cholesterol, acetic acid, tromethamine, sodium acetate trihydrate, tromethamineHCl, sucrose. These vaccination have their own storage condition and current shelf-life with its appropriate storage temperature (status of Dec 05, 2020). Unopened vaccine can be kept stable in frozen state at -20°C up to 6 months and can also be stable up to 30 day at 2-8°C. This vaccine room temperature stability is up to 12 hours. Punctured vaccine vial storage condition is +2°C to +25°C up to 6 hours (Xia, 2021).

This is also important to be aware about the age indication that this Moderna vaccine should be given to the individual 18 year of age and older. Intramuscular is its route & site of administration. Considering thawed vaccine for use and do not dilute vaccine before use. According to Centers of Disease Control and Prevention (CDC) Recommendation, the second dose of Moderna vaccine be given within 4 weeks of the first dose but should not be increased more than six weeks gap between doses (COVID).

COVIDArm

In December 2020 a trial was carried out on coronavirus efficacy, all participants were received Moderna vaccine doses but 228 participants out of 15,185 participants at phase 3 trial were reported adverse events at minimum dose of Moderna vaccine such as hypersensitivity with rashes on the site of injection and urticarial reaction that is a skin rashes appears with itchiness (Janice Hopkins, 2020; Papamanoli, Thorne, & Pseudos, 2021). Post vaccination adverse effects like an eruptive, morbilliform rashes that resembles to a drug rash were also observed after 48 Hrs. of administration.

COVID arm four cases were reported days after administration of first dose of Moderna vaccine, COVID arm a localized erythematous rash which were shows on the skin at the site of injection and this is a possible side effect which may discourage any one from obtaining 2nd dose of Moderna vaccine. Although oral histamine and topical steroids are proved to be used for controlling these symptoms and clearing the rash (Connolly et al., 2022; Crommelin, Anchordoquy, Volkin, Jiskoot, & Mastrobattista, 2021).

Other Side Effect

In some cases few people who received Moderna vaccine also reported inflammation of heart muscle i.e. myocarditis and inflammation of the lining outside the heart i.e. pericarditis. These patients reported chest pain, shortness of breathing, fast heart beat feeling pounding heart but there is very low chances of myocarditis and pericarditis symptoms occurs in everyone after receiving Moderna vaccine

This is also to be concern that Moderna vaccine has some side effect such as muscle ache which can be happens with pain in the body. Many Individuals reported fever, nausea feeling, chills, vomiting, redness and swelling and much hurtful pain at the site of injection after first or second dose of this vaccine. Few cases reported of anaphylactic reaction so it was advised by UK government to the people with any history of anaphylactic reaction ask doctor before receiving Moderna vaccine. The statement which stated by CDC is that Individuals may receive Moderna vaccine that have not had anaphylactic reaction and are not allergic to any ingredient in the vaccine but have had allergic from food, pets, or any medicine (Mahase, 2021).

Stronger Immune System after Second Dose of Moderna Vaccine

There is no any evidence were found that the people who received first shot have an enough long-lasting protection against corona virus. In some studies it is found the necessity of receiving second dose of Moderna vaccine because a weak immune response was found after few weeks of taking first shot of Moderna vaccine. After some trials it was found that second shot is always given after first shot and by the use of second shot, of Moderna vaccine, the reaction of immune system were became strong.

Booster Dose

Recent studies demonstrated weakened humeral response to vaccination noticed in patient who has autoimmune disease. COVID-19 infection associated with Immunosuppressed responses had observed in patient in spite of vaccination. Study describes that it enhances humoral response after taking 3rd dose of SARS-CoV-2 vaccination in patient with immunosuppress transplant patients. US FDA amended EUA only for Moderna and Pfizer vaccines, to allow for 3rd booster dose provide to certain immune compromised persons, organ transplant recipient and people older than 65 year. These people will get third booster dose similar to previous two doses of Moderna vaccine in US. FDA and CDC also conducting reviews of booster dose in other population.

This survey based article aims is to show evidence about Moderna vaccine. Through this survey we will highlight Moderna vaccination's pharmacological characteristics, indication, contraindication, and some adverse event that occurs to different people. This survey also manifests different people's opinion and their experience upon Moderna vaccination (Meo et al., 2021).

Method

We have generated a survey based google form which we have distributed this form among 100 of participants. In this we asked certain questions about the Moderna vaccine. And then we gathered all the possible information. We followed the guidelines of FDA and WHO and also read different article about it from the pubmed, google scholar, sciencedirection, also from ELSEVIER and many other. then we worked on the google form for the survey and also for the awareness of people.

Result

In this survey-based article, we have evaluated patients response, vaccine effectiveness and pros and cons of the vaccine. As per global studies, it has been proven that two-dose regimen of Moderna vaccine is 93% effective in preventing

and reducing hospitalization. If the single dose or two dosed regimen is concerned, we found out that it provides more protection than single dosed vaccines as it ensures a higher level of post vaccination anti SARS-CoV-2 antibody levels. The postvaccination antibody analysis included 71 participants who have taken part in survey out of which 95% were females. The assuring and satisfying value of the survey is that 80% were undergraduate students that mean the literacy leads to assuring results. It was observed that 80% of participants had 2nd dose assigned 28 days apart 1st dose. If the compliance issue is concerned so, 11.7 % of participants strongly agreed to the safety and efficacy of the vaccine while 45% were agreed to this context. According to the survey results, only 5.6 % thinks that Moderna vaccine contains hazardous ingredients in it and people have allergy to the contents of the vaccine. As per the controversy over vaccine's ability to change DNA composition of participant, 25% think that it is true. Impurity related issues were evaluated in the survey, 66.7% participant have agreed that it is free of substances like eggs, preservatives or metals etc. the survey also collected responses of 2nd dose efficacy and it was found that 67% participants agreed that Moderna Vaccine has enhanced efficacy (95%) with 2nd dose of vaccine. Regarding side effects associated with Moderna, data collected is that 29.2 % participants have experienced COVID ARM and 21% participants had applied topical steroids while oral histamines in cleaning rashes were assured by 30.6 %. The examination regarding severity of the rash in the arm had shown that 19.4% of the affected participants advised that it should not or does not deter you from 2nd dose of vaccine. Other than COVID ARM, the side effects observed by the participants were fever (in 38 participants), muscle pain (39 participants), tiredness (21) and chills in 11 patients. It was said that myocarditis and pericarditis is associated with the use of Moderna vaccine so, 88% participants hadn't experienced these effects. In addition, 34% agreed that potential benefits of the vaccine are huge enough to outweigh MC OR PC events risk. We have checked the awareness ratio of population by asking if they know that it was not recommended for Moderna booster shots but now, CDC have recommended booster shots in people with underlying illness and people's with age above 65 years. Agreement responses were collected from 52.8% participants.

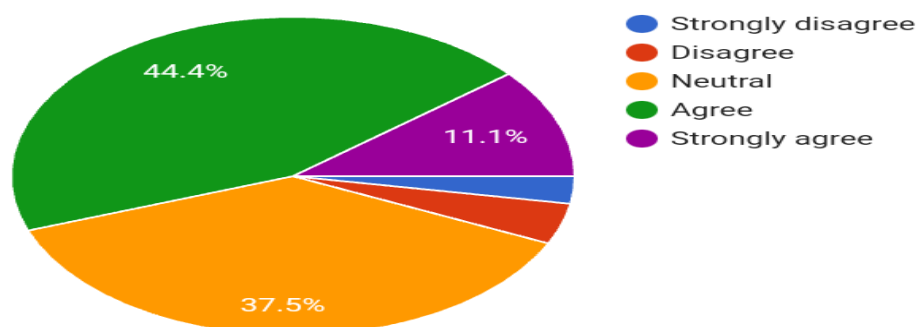


Figure 1: Participant's response regarding safety and efficacy

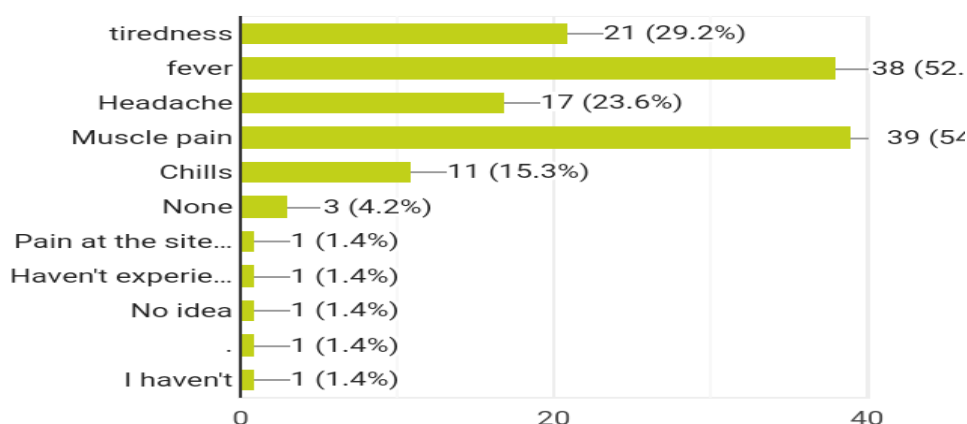


Figure 2: Presenting the extent to which participants experienced side effects

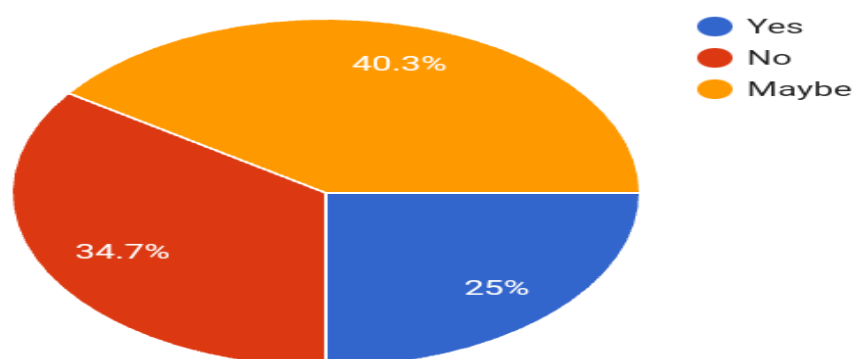


Figure 3: Population's mentality perception/reality

Discussion

Moderna vaccine which we have discussed above is designed to two-dose regimen and it provided a high level of protection against COVID-19. As we all know about the Moderna vaccine controversy that leads to defame the vaccine not only in USA but also to the world. In Pakistan, after sinovac and sinopharm, Pfizer and Moderna vaccine were in preference and initially, Moderna was approved for controlled i.e. only for population that was going abroad. After that, it had been in used widely in Pakistan for assuring immunization of people aged above 18 years. A large number of data have generated to evaluate the vaccine safety and efficacy but it has not gain that much satisfaction in people's choice. To validate and to verify the vaccine effects itself, this survey is relatively significance as it has involved the data of population with factors like gender, age, compliance, awareness, belief etc. It is mRNA vaccine, since RNAs are unstable; they require extreme refrigeration for stability during distribution. But as compare to other vaccine like Pfizer or Biotech, it is easier to transport and store because it is less temperature sensitive. It is recommended for people above 18 years of age. In the survey, it has shown that most participants were under graduating, that is the assurity of the results as literate population understands

these things easily and have awareness much more than less literate people so; this survey can also outweigh the risk of biasing and free of myth-believers. This survey is further confirmation of 94% Moderna vaccine efficacy. Certain number of participants agreed that it is 94.1% effective after 2nd dose that proves that two dose regimen of the vaccine is highly suitable. Data hiver assured its efficacy as it does not involve any metal impurity or hazardous substances. The advantage of Moderna vaccine is that if anyone failed to have 2nd dose in 28 days period, even after 42 days, there is no need to restart the series. The data related MC and PC events shows that there are negligible number of participants that experienced it, so, there is a need to further evaluate the reason behind these events as the studies are not complying with relation of Moderna with these events. Responses shows that that the COVID arm that is associated with Moderna vaccine is not that severe that it deters you to have 2nd dose. Data showed that topical steroids and oral antihistamines are effective in cleaning rashes. All these results are making it safe and effective and potential benefit outweighs the side effects.

This survey also shows that there is the interference of false perception, biasing and myth-believing in successful evaluation of efficacious profile of Moderna vaccine.

Conclusion

We did a small survey in which we get 71 responses,our survey form was not only a survey based form but it was also an awareness form by which did a survey as well as we aware the people about the Moderna vaccine pros and cons and by this survey we have concluded that there are no severe adverse effects or intense side effects of Moderna except the covid arm(pain and swelling at the administration site),there were only 29.2% responses about the covidarm,and the news about the myocarditis and pericarditis was only a myth or a false perception and if someone is facing these things then may be it is from any other source or by any other reason.The main purpose of our survey is not only the collection of responses about the Moderna vaccine but also the spreading the awareness about the Moderna vaccine. Most of the population do not consider it suitable for ages 18 or above. However, it is not an heat sensitive vaccine and the vaccinated persons are not found to be affected by COVID-19 after getting both of the doses of Moderna vaccine. This vaccine has been found to be the most effective vaccine among all.

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