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A Survey on Post Covid-19 Vaccination Symptoms to Separate Myths from Facts.

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ABSTRACT
BACKGROUND AND OBJECTIVES*:*
A communicable disease known as COVID-19(SARs-CoV-2) has caused a worldwide Pandemic. To ultimately combat the rising COVID-19 Pandemic, it is the necessity of the hour to develop an effective and safe vaccine against this contagion. Vaccines usually need years of study and testing before being out there for the general population, however, in 2020, scientists commenced on a race to produce safe and effective coronavirus vaccines in record time. As the vaccination process has been started recently, very little is known regarding the real world post-vaccination experience outside of clinical trial conditions. It's vital to separate myths from facts, when deciding whether or not to get the vaccine. Given the importance of vaccination in controlling the pandemic, we conducted a survey, regarding Covid vaccination.
MATERIALS AND METHODOLOGY*:*
An online survey of a total of 1000 Participants was conducted through a Google form which included questions related to their own post- vaccination experience and myths. Later on, a 15-day follow-up was also taken.
RESULTS*:*
Total 1000 Participants responded to the Present survey. The most common Post Vaccination symptoms were pain on injected site, followed by fever, and the least ascertained was the anaphylactic reaction. No long-term complications or hospitalization was required.
INTERPRETATION*:*
On evaluation, the side effects observed were mild to moderate in nature.
CONCLUSION*:*
With the intensity and duration for which the post-vaccination symptoms lasted, we can conclude that the vaccine is safe and tolerable.
KEYWORDS*- COVID-19, Myths, Post-vaccination symptoms, COVID-19 Vaccination, Vaccine hesitancy, Vaccine safety.*

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I. Introduction

A recently discovered coronavirus known as COVID-19(SARs-CoV-2) has caused a worldwide pandemic of respiratory disease. As we are in the midst of the pandemic, COVID-19 has resulted in significant burdens globally. It has caused a high rate of infection, death, financial hardships, and fear of uncertainty regarding continued impact. It has particularly placed health care workers and their families at unprecedented

levels of risk. They are exposed to high-demand settings for long hours, living in constant fear of disease exposure while separated from family and facing social stigmatization, leading to tremendous levels of psychological stress among them. [1] The healthcare workers face numerous challenges to reduce the spread of infection; developing appropriate short-run strategies; and formulating long-run plans. Simultaneously scientists were trying to develop 'the vaccine', an essential tool, which carries tremendous hope to regulate the pandemic all over the world. Vaccines save countless lives every year. They prepare the body's natural defences; the immune system, by training and instructing them to identify and fight off the viruses and bacteria they aim. Once vaccinated, if the body is again exposed to those microbes, the body is straight away ready to destroy them, preventing diseases. [2] Before the approval of Food and drug administration, the vaccine has to pass through numerous phases. Vaccine development is filled with possibilities for downfall. As it is developed in a shorter period of time, its protective efficacy is the topic of discussion. Because of its noted side effects like fever, fatigue, etc., its safety issues are a concern.

On contrary to its side effects, the one of the most effective means of protection against COVID-19 is natural immunity combined with vaccine-induced immunity. The vaccine protects the vaccinated person itself and the individuals surrounding them. It reduces the spread and replication of the virus preventing it from mutation. It is one of the most reliable method of prevention to control this pandemic by bringing about mass immunization.

The initial phase of prevention of the development and approval phase has been completed. The next phase which involves protective efficacy, safety issues, affordability, and the most challenging vaccine hesitancy needs to be outreached. [3]

Now that, the awaited COVID-19 vaccine is finally available for administration for the general population, if the attitude, awareness & knowledge among the general population is negative, it will create vaccine hesitancy, probably due to myths & unauthentic information or deep-rooted fears present among people. Unfortunately, the fear seen for vaccination is on a higher scale than the disease by itself. Administration, public health officials, and advocacy groups must be prepared to address the myths about the vaccine and build awareness so that the people will accept immunization. To build trust and acceptance regarding the vaccine, a mass approach and various strategies will be required among the general population.

We conducted a survey that can help to contribute authentic information regarding the side effects and safety issues of the vaccine. The findings of the present survey can be used as a tool to solve various misinformation related to the vaccine with proper evidence and reasoning. With sufficient knowledge and literature, this phase of vaccine administration can be tackled successfully.

II. Materials And Methodology

An online questionnaire was formulated through a Google form containing questions designed for self-completion. The link of the questionnaire was sent through e-mails, WhatsApp, and other social media to the participants. The participants were requested to spread out the survey to as many people as possible. Thus, the link was passed on to other participants apart from the first point of contact and so on. The questionnaire was divided into four sections each to cover the overall data. The first section included questions that obtain the demographic data, vaccination status of the participant, and systemic disease if any. The second section of the questionnaire contained questions regarding vital signs that are blood pressure, temperature, pulse rate, and spO2 levels. The third section included questions that evaluated symptoms experienced by the participants for instance pain on injected site, body ache, headache, fever, etc. The final section contained miscellaneous questions viz. willingness to get vaccinated or not, the reason for being unvaccinated, myths heard about the vaccine. Also, later on, a 15-day follow-up was taken to evaluate any need for hospitalization and\or long term complications. If the status of a participant was unvaccinated, the participant was forwarded directly to the final section. The same was carried on after the booster dose.

III. Results

A total of 1000 participants responded to the present survey and a 15 day follow-up was taken for the same participants after the vaccination.

The majority of participants included dental students (59%) followed by teaching staff (18%) and postgraduate students (12%). The mean age was 24.5 years. According to the gender, the female group (58%) was in predominance than the male group (42%). Only 6% of participants had covid history.

It was observed that a large number of participants under the study, which accounts for 92%, were aware of the side effects encountered after vaccination. Amongst the overall participants, 98% were vaccinated, out of which 12% had any one of the systemic diseases. The common systemic diseases were diabetes (40%) and blood pressure (30%) followed by gastrointestinal diseases (26%). A very less percentage of participants had asthma (8%), anemia (5%), thyroid (4%), fits (3%), endocrine disorders (2%), bleeding disorders (1%), and

infection (1%), other (1%). Of the respondents, 95% of participants had been vaccinated by Covishield and 5% were vaccinated by Covaxin.

From the data on vital signs, it was observed that 95% of participants experienced low pulse rate, 46% participants experienced raise in temperature within 12 hours of vaccination, 18% participants experienced a raise in blood pressure level immediately after vaccination, and only 3% of participants observed drop in spO2 levels within 12 hours of vaccination.

When the participants were asked about post-vaccination symptoms [chart no.1], the most common symptom reported was pain on injected site which was experienced by 81% of participants, 51.1% of participants had episodes of fever. Body ache was experienced by 49% of participants and headache by 43% of participants. 41% of participants' complaint of fatigue, 27.7% of chills, and 26.3% of drowsiness. 23.4% of participants noticed soreness on the injected site. 19% of participants felt nauseated, 15% of participants suffered from diarrhoea. Additionally, 13.6% of participants had a cough and 12.2% had vomiting. The least common symptom was redness on injected site which was experienced by 5% of participants and only 4% of participants had an anaphylactic reaction.

Overall, 96% of participants developed symptoms within 1-2 days, 3% of participants developed symptoms within 3-4 days and only 1% of participants developed symptoms after 5-7 days. The symptoms subsided within 1-2 days of taking vaccine in 91% of participants, in 6% of participants symptoms subsided within 3-4 days and in 2% of participants symptoms subsided within 5-7 days but only 1% of participants had symptoms for more than 7 days. Among 20-30 years of age group, the frequency and duration of symptoms was 85%, in the age group of 30-40 years it was 79%, in the age group of 40-50 years it was 75% and the age group of 50-60 years it was 65%. It was noted that the frequency and duration of post-vaccination symptoms decreased as the age advanced.

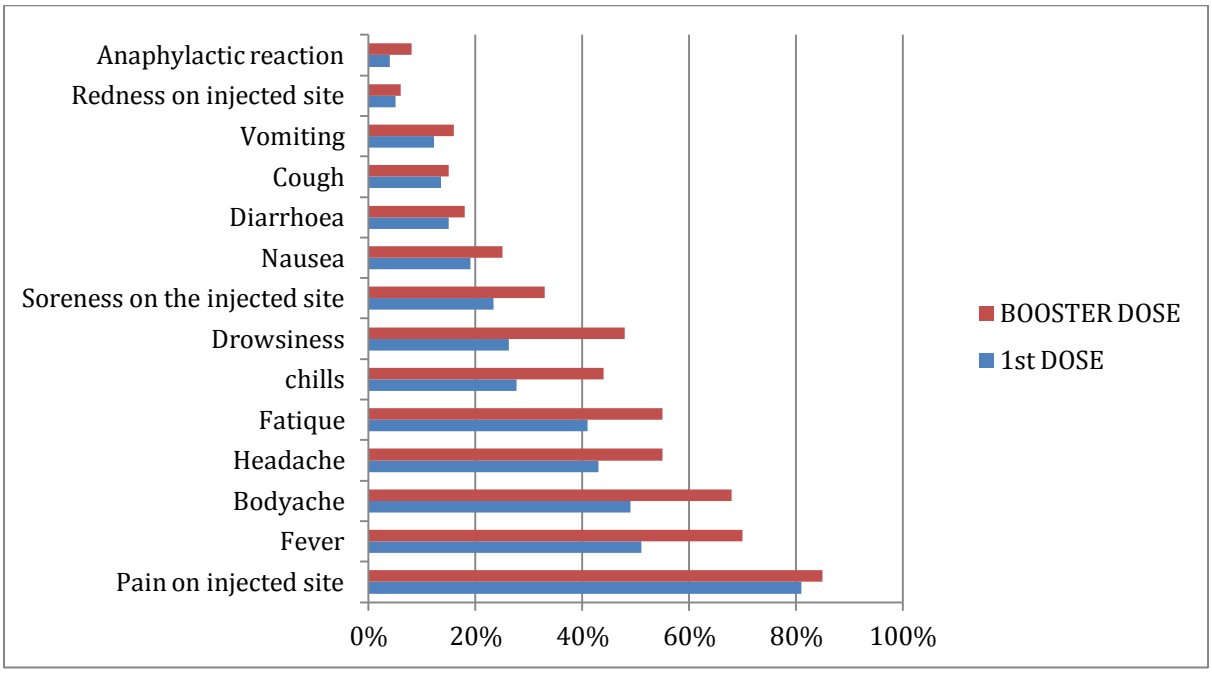

Chart no. 1

From the participants that suffered from post-vaccination symptoms, 65% of participants took medications for post-vaccination symptoms which helped to subside the symptoms within few hours. After a 15 days follow-up, 0.3% of participants in the present study were found to be infected with the virus after vaccination. No long-term complications were observed in the participants and none of the participants have required hospitalization. Overall, 26% of participants got the booster dose. Similar symptoms were reported for booster dose but the frequency and duration of symptoms were increased. The symptoms of booster dose subsided within 1-2 days for 6% of participants, within 3-4 days for 81% of participants, within 5-7 days for 10% participants and after 7 days for 1% participants.

Of the participants that were not vaccinated, 72% of participants declined to get vaccinated in the future. The most reported reason for the same was misinformation related to the side effects of the vaccine and doubts related to its efficacy and safety.

The most common myths or misinformation about vaccination that was observed through this study, that creates the above doubts are,
1. COVID-19 vaccines can weaken the immunity and make you more susceptible to SARs-COV-2, 2. Infertility,
3. Death,
4. As the vaccine was developed in a shorter period of time compared to other vaccines, its efficacy and safety may have been compromised,
5. Fear of the post-vaccination symptoms and long-term complications of the vaccine.
No correlation was observed between the participants having COVID-19 history and post-vaccination symptoms.

IV. Discussion

The participants responded to the questionnaire for the survey through online means, as it is a safer method of collecting data during the pandemic.

Among the present study participants, the majority were dental students, followed by teaching and non-teaching staff. So, the mean age was 24.5 years and the female group was predominant. A correlation was observed between the age and the post-vaccination symptoms from our study. Reporting rates of post-vaccination symptoms reduce as the age advances. The latter is supported by the observation that older people show lower systemic levels of IL-6, IL-10, and C-reactive protein after vaccination, which might contribute to their tendency to report fewer systemic effects. [4] As with age groups, likewise, a correlation was observed in the present study between participants having systemic diseases and post-vaccination symptoms. Similar post-vaccination symptoms were observed in participants having the same systemic diseases. For example, participants with Hypertension reported elevated levels of blood pressure post-vaccination, and participants having Diabetes reported fewer post-vaccination symptoms because the immune response is lowered in diabetes.

A small percentage of participants in the present study reported mild anaphylactic reactions which subsided after antihistamine medication within hours. Some researchers say that polyethylene glycol (PEG) is the anaphylaxis causing agent in mRNA vaccines. [5] mRNA vaccines use hallow lipid nanoparticles to store and then to deliver their mRNA payload to cells. The lipids in these particles are linked to PEG and, under normal circumstances, assist them to sneak by the immune system. [6]

The majority of the participants in the present study reported symptoms with less intensity after the first dose of vaccination compared to the booster dose. Similar symptoms were reported after the booster dose but the nature of symptoms was of higher intensity and was present for a more prolonged duration than the first dose. A 15-day follow-up was taken after vaccination for both doses and was observed that no serious, long term complications requiring hospitalization were reported in our study. No participants in the present study reported to have any symptoms that failed to subside after medications. A review article (Saleh E, Moody MA, Walter EB, et al, 2016) concluded that the timing of antipyretic administration was the key because when antipyretics were given as a treatment for symptoms (rather than for prevention of symptoms) after vaccination no impact was seen on antibody response. [7] Thus, the use of medications to treat symptoms arising after vaccination seems to be effective, without impacting the immune response to vaccination.

The most-reported misinformation in the present study is that COVID-19 vaccines can weaken immunity and make you more vulnerable to SARs-COV-2. Because of such misinformation, Vaccine hesitancy and lack of trust are developing regarding the safety and tolerability of the vaccine. COVID-19 vaccine is an mRNA vaccine that directs cells to produce a safe piece of what is called the "spike protein." The spike protein is present on the surface of the coronavirus. The coronavirus mRNA vaccines do not use the live virus that causes COVID-19, ruling out the possibility of getting infected with the virus post-vaccination. mRNA does not attempt to enter the nucleus of the cell, which is where our DNA (genetic material) is present and the cell breaks down and gets rid of the mRNA once it's done giving instructions resulting in no long-term complications. [8] Also, there is a lack of trust because COVID-19 vaccines are developed in a shorter time compared to other vaccines. The procedure to make mRNA vaccine can be standardized and scaled up because it can be produced in the laboratory using readily available materials making vaccine production faster than traditional methods. [9] Stress in various forms is known to influence the immune system and in particular the inflammatory response. [10] 92% of participants were aware of the side effects of the vaccine which may have triggered fear contributing to the nocebo effect. [11]

The majority of participants received Covishield, because of which very little information is reported about Covaxin. There was no correlation observed related to post-vaccination symptoms and past COVID infection history.

'The Lancet' published an article recently which has stated that the virus named SARS-CoV-2 that causes COVID-19, is an airborne pathogen. [12] The only way to control airborne diseases is vaccination in the overall population because the measures used for precautions have their own limitations. The crucial challenge

in mass immunization is the misinformation about the vaccine that is spreading. The public must be educated about how and why the post-vaccination symptoms develop and that the symptoms are a positive response that the immune system is actually responding to the vaccine. [13] Health professionals can be a mode of educating and solving the doubts of the public. [14] The findings of the present study and its correlation with the facts will resolve many of the misinformation or myths related to the COVID-19 vaccine. The present article provides a descriptive answer to the public regarding the vaccine.

V. Conclusion

The post vaccination symptoms were mild in nature for the 1st dose which lasted for nearly 1-2 days and moderate for the 2nd dose which lasted for 3-4 days. From the intensity and the period of time for which the post vaccination symptoms lasted, we can conclude that the vaccine is safe and tolerable. No participant in our study required hospitalization. The Post vaccination symptoms subsided after taking medications, hence it can be said that the symptoms are not life threatening. The Post vaccination symptoms in the present study were persistent with an immune system response commonly associated with vaccines. The present study will guide the individuals to separate the myths from the facts to take proper decision related to the vaccine.

Although the finishing line seems to be visible, there is still much difficult terrain to pass.

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