Proceedings S.Z.M.C. Vol: 37(1): pp. 06-10, 2023. PSZMC-869-37-1-2023

Is Covid Vaccine Hesitancy Unfounded? A Local Comparative Study on Short-Term Side Effects of Different Covid Vaccinations

[1]Nimrah Komal, [2]Ali Mujtaba, [3]Muhammad Wajid Munir, [4]Aftab Ahmed, [5]Syed Abdul Ahad,[1]Hassan Mumtaz, [5]Syed Abdul Rehman Shah

[1]Department of Public Health, Health Services Academy, Islamabad.
[2]Department of Management Sciences, Riphah Int University, Islamabad.
[3]Department of Medicine, IHITC, Islamabad.
[4]Department of Rheumatology, PIMS, Islamabad.
[5]Department of Medicine, Dow University of Health Sciences, Karachi.

ABSTRACT

Introduction: Side Effects of Covid Vaccinations have been responsible for Vaccine hesitancy (VH), which is defined as the delay in acceptance or refusal of vaccines despite availability of vaccine services.
Aims & Objectives: To evaluate and compare the severity of common short term side effects of different types and dosages of vaccines in different age groups at a local setting and whether Covid vaccine hesitancy is unfounded.
Place and duration of study: The present study was conducted at Specialist Clinic Haroon Chowk Rawalpindi & Doctors Clinic Karachi, Pakistan between August and September 2021
Material & Methods: This cross-sectional survey-based study was conducted based on a structured close ended questionnaire designed using google forms after the immense literature search on the research question and provided to individuals aged 18 years and above who had either completed or partially completed their vaccination dosage at any center. SPSS version 24 (IBM, Armonk, New York, USA) was used for data analysis, P-value<0.05 was taken as significant.
Results: The survey was conducted on a total of 248 patients Out of 248, 150 (60.48%) were male & 98 (39.52%) were females. Majority 153(61.69%) were of age group 19-30 years, whereas 95 (38.31%) were aged between 31-40 years. 17 participants reported that they were allergic, 7 patients had asthma, 8 respondents mentioned that they were diabetic and hypertensive, the remaining participants did not report any comorbidities at all. Regarding vaccination status, 243 (97.98%) respondents confirmed that they completed the two-dose vaccination process. Short term adverse events were noted, including fever, severe swelling, myalgia, a change in taste, a headache, hypersensitivity, and medication-related symptoms.
Conclusion: Compared to COVID-19 vaccines created using inactivated virus, those based on messenger RNA were found to be significantly safer for patients. Widely ranging short term mild and manageable adverse effects were recorded. Covid vaccine hesitancy appears to be unfounded.

Keywords: Vaccine hesitancy, COVID-19, Public Health, side effects

INTRODUCTION

Vaccine is the cornerstone of the technical solutions adopted in fight against COVID-19 pandemic. In human struggles against major infectious diseases such as smallpox, tuberculosis, polio, rabies, typhoid, plague and many more, vaccines have played critical roles in reducing disease-specific mortality rates[1].

Vaccine hesitancy (VH) defined as the "delay in acceptance or refusal of vaccines despite availability of vaccine services"; it is an emerging public health challenge nourished by misinformation related to vaccines effectiveness and safety. In a recent nation-wide study, vaccines' potential side effects were the most frequent cause for VH among population groups in the United Kingdom (U.K.)[2]. This finding was supported in the context of COVID-19 vaccines, because a fear of side effects was the most prominent reason to decrease the readiness of healthcare workers and students in Poland to accept the vaccination[3,4].

The short-term side effects of vaccines vary in their clinical presentation; however, they are commonly related to prophylactic vaccines' humoral immune response[5].

A global survey of 140,000 people on "attitudes to vaccines" found that countries with successful

public-awareness programs against multiple infectious diseases have very high rates of consensus on vaccine prevention, efficacy, and value[6].

Mild to moderate side effects following a COVID-19 vaccination, including a low-grade fever or muscular aches, are usual and not cause for alarm as they reflect the body's immune response to the vaccination, specifically the antigen, and are priming itself to attack the virus. In most cases, these signs and symptoms go away on their own after a few days. Constant surveillance of vaccine-related adverse events is performed with the aim of enhancing vaccine safety[7].

Reported side effects to COVID-19 vaccines have mostly been mild to moderate and short-lasting. They include fever, fatigue, headache, muscle pain, chills, diarrhea, and pain at the injection site. The chances of any of these side effects following vaccination differ according to the specific COVID-19 vaccine[8].

The objective of this survey was to evaluate the side effects of different types of vaccines on different age groups, and to compare the common side effects with the types and the dosage of vaccines. The rationale of this study was to determine subjectively the adverse effects of COVID-19 vaccine as experienced by study population. Hence, we can objectively address Covid vaccine hesitancy, and the phobias related to Covid vaccination.

MATERIAL AND METHODS

This cross-sectional survey-based study was conducted at the Specialist Clinic Haroon Chowk Rawalpindi & Doctors clinic Karachi, Pakistan. Ethical approval was granted from the Institutional Review board (IRB) Committee after going through the questionnaire in detail. The data collection process was done within the 2-month time between August and September 2021.

Covid Vaccination include AstraZeneca, CanSino, Moderna, Pfizer, Sinovac & Sinopharm. The structured close ended questionnaire was designed using google forms after the immense literature search on the research question. The questions were designed on the basis of WHO reported side effects. The questionnaire consisted of two components 1. The demographic details including age, gender, comorbidity and others. Whereas Part2- involved close ended questions regarding the side effects of the vaccines and their duration. Rare adverse effects like myocarditis, pericarditis, and lethal anaphylactic reactions were not specifically asked in the study, as there could have been recall bias and without substantive diagnostic evidence. Before sharing the questionnaire, the consent was taken verbally from every participant. Moreover, the clear purpose of the survey form was also explained. Confidentiality of all the participants were strictly maintained. The results of our survey were shared with the participants.

All individual above the age of 18 years who had either completed or partially completed their vaccination dosage at any center were included in the study. Those who are not able remember or interpret the side effects of vaccine.

SPSS version 24 (IBM, Armonk, New York, USA) was used for data analysis. The analysis was performed in two parts. First, descriptive statistics (frequencies) were used to describe the demographic details of the respondents. Secondly, Pearson's Chi-Square test was performed to determine the comparisons of the objectives of this study. P-values of less than 0.05 was considered as significant.

RESULTS

The survey was conducted on a total of 248 patients with the age varying from 29 to 65 years. Upon asking about the comorbidities during the vaccination process, 17 participants reported that they were allergic, 7 patients had asthma, 8 respondents mentioned that they were diabetic and hypertensive, the remaining participants did not report any comorbidities at all. Regarding vaccination status, 243 (97.98%) respondents confirmed that they completed the two-dose vaccination process, the rest had their 2nd dose left, as shown in Table-1.

Adverse Events	Vaccination Status		p-Value
	1st Dose	2nd Dose	
Fever	0	45	0.00
Painful Swelling	0	29	0.00
Change of Taste	0	20	0.00
Myalgia	35	92	0.00
Headache	0	57	0.00
Hyper-sensitivity	5	0	0.00

Table-1: Comparison between Post-Vaccine Adverse Events and Vaccination Status.

Out of 248, 150 (60.48%) were male & 98(39.52%) were females. Majority 153(61.69%) were of age

group 19-30 years, whereas 95 (38.31%) were aged between 31-40 years, as shown in Table-2.

Gender	Vaccination Type						Total
	Astra-Zeneca	Can-Sino	Moderna	Sino-pharm	Pfizer	Sino-vac	
Male	34	30	21	26	15	24	150
Female	14	19	15	7	14	29	98
Age							
19-30 yrs	32	27	23	12	18	41	153
31-40 yrs	16	22	13	21	12	13	95

Table-2: Demographics of the participants

The questions about common post-vaccination adverse effects were also asked. Interestingly, only 45 and 29 patients reported fever and swelling at the injection site. Likewise, 20 and 57 respondents complained about change of taste and headache as a post-vaccination reaction. On the other hand, 92 patients confirmed that they experienced myalgia . Post-vaccination severity like experiencing pneumonia like symptoms or hospital admission was reported by none of the participants. However, 19 patients had to take medication (paracetamol in most cases) either to reduce the severity of post-vaccine reactions (if any) or as a precaution against the onset of any kind of pain. Comparison between Post-Vaccine Adverse Events and Vaccination Type is shown in Table-3.

Adverse Events	Vaccination Type						p-Value
	Astra-Zeneca	Can-Sino	Moderna	Sino-pharm	Pfizer	Sino-vac	
Fever	0	0	0	0	0	45	0.00
Painful Swelling	0	0	0	0	0	29	0.00
Change of Taste	0	0	0	0	0	20	0.00
Myalgia	25	0	14	32	18	3	0.00
Headache	0	0	0	0	0	57	0.00
Hyper-sensitivity	0	0	0	0	0	43	0.00

Table-3: Comparison between Post-Vaccine Adverse Events and Vaccination Type.

DISCUSSION

Since the start of the COVID-19 era, scientists and doctors are consistent in finding treatment for this disastrous pandemic in the world, and it is apparent that every therapy has its adverse reaction which could result in creating a kind of dubious situation among the people. This study highlights the association between the vaccine doses and adverse reactions in patients. Some symptoms might not be stated due to unawareness about the severity or consequences or difficulty to approach the medical center. Research by Tom Shimabukuro et al.[9] shows that anaphylactic reactions occur in most of the patients after the first dose of vaccines, although these reactions are also associated with allergic histories, more common in women and the population taking different other drugs, in contrast, our study showed only a small percentage of people faced this problem after the first dose.

This manuscript also juxtaposes side effects of individual vaccines, and present` that only Sinovac manifest most of the complication except the interaction with other drugs, furthermore drug-drug interactions and myalgia are related to Sinopharm, the results also enumerate about other vaccine types of not having any complication except for the Pfizer Astrazeneca, Moderna which cause muscle pain. Stressing on drug interactivity, a study interprets that the vaccines, especially Pfizer react with antiepileptic medications. The vaccine specifically mounts a robust response of immune cells, leading to the production of different cytokines like interferon-gamma which ultimately inhibit the cytochrome p450 system and affect the bioavailability and metabolism[10]. Another report elucidates the deadly anaphylactic reaction of Pfizer and Moderna independent of dosage and locations, which suggests that polyethylene glycol could be the offender molecule, but the real cause is still idiopathic. In the same article, it is mentioned that these two vaccines are also the culprit of rare orofacial abnormalities causing Bell's palsy[11]. A study conducted in Malaysia[12] has some variable findings which exhibit that Sinovac was less harmful than the nucleic acid and viral vector vaccine namely Pfizer, Oxford-AstraZeneca respectively. The side effects were more pronounced after the second dose[13] and are 12 times[14] less common with Sinovac, however, results of this study show that Sinovac was affiliated with almost all complications being mentioned, this difference might be because both the studies were conducted on different populations.

According to our findings, the most common complications were fever, painful swelling, change of taste, myalgia, headache, hypersensitivity, and drug-drug interactions that occurred after the second dose, however, findings in one study[9] show that these issues were common with the first dose. As stated by the Centers for Disease and Prevention (CDC)[15], the population who has chosen Pfizer as their vaccine encounter at least one local reaction (88.7%) in younger patients and 79.7% in elderly) in which pain at the inoculation site is usually prevalent in young population irrespective of the dose, erythema and swelling were less frequent but seen after the second dose, these findings mismatched our results as nearly all bad effects accompanied the second dose, in addition, one of

the findings in CDC report is similar to our results as the myalgia (muscle pain) mentioned in the systemic reactions heading took place after a second shot not determined by age and vaccine type. The Food and Drug Administration (FDA) and a study outline some associated complications that were reported in different age groups, which shows that headache, pain at the injection site, fatigue, and muscle pain were mainly experienced by the young population[16,17].

This study shed light on the association of side effects with the first and second doses, it also perspicuously explains the relation between side effects and different types of vaccines commonly used to prevent the spread of the pandemic. The significance of the results as shown by the zero P-value of this study gives this a chance to stand with confidence in the sea of research on vaccines and their side effects. However, the population was limited to one hospital only and involved only 232 individuals. Moreover, the current study only included the side effects that everyone usually experienced after the vaccination. This approach, in our opinion, helped to decrease the chances of selection bias. It appears that vaccine hesitancy in our local setting based on short term adverse effects is relatively unfounded.

CONCLUSION

Compared to Covid - 19 vaccines created using inactivated virus, those based on messenger RNA were found to be significantly safer for patients. Manageable side effects were noted, including fever, painful swelling at the injection site, myalgia, a change in taste, a headache, hypersensitivity, and medication-related symptoms. Vaccine hesitancy related to the Covid 19 vaccination appeared to be unwarranted. However, a more in-depth investigation is needed to look at the whole range of reactions people have had to the Covid-19 vaccine, both the common ones and the unusual ones.

REFERENCES

1. Harrison, E.A.;Wu, J.W. Vaccine confidence in the time of COVID-19. Eur. J. Epidemiol. 2020, 35, 325–330.
2. Luyten, J.; Bruyneel, L.; van Hoek, A.J. Assessing vaccine hesitancy in the UK population using a generalized vaccine hesitancy survey instrument. Vaccine 2019, 37, 2494–2501
3. Szmyd, B.; Bartoszek, A.; Karuga, F.F.; Staniecka, K.; Błaszczyk, M.; Radek, M. Medical Students and SARS-CoV-2 Vaccination:Attitude and Behaviors. Vaccines 2021, 9, 128. [CrossRef]
4. Szmyd, B.; Karuga, F.F.; Bartoszek, A.; Staniecka, K.; Siwecka, N.; Bartoszek, A.; Błaszczyk, M.; Radek, M. Attitude and Behaviorstowards SARS-CoV-2 Vaccination among Healthcare Workers: A Cross-Sectional Study from Poland. Vaccines 2021, 9, 218.
5. Gonçalves, A.K.; Cobucci, R.N.; Rodrigues, H.M.; De Melo, A.G.; Giraldo, P.C. Safety, tolerability and side effects of humanpapillamavirus vaccines: A systematic quantitative review. Braz. J. Infect. Dis. 2014, 18, 651–659.
6. Khan YH, Mallhi TH, Alotaibi NH, Alzarea AI, Alanazi AS, Tanveer N, Hashmi FK. Threat of COVID-19 vaccine hesitancy in Pakistan: the need for measures to neutralize misleading narratives. The American journal of tropical medicine and hygiene. 2020 Aug 5;103(2):603-4.
7. Side effects of COVID-19 vaccines [Internet]. Who.int. [cited 2022 Dec 21]. Available from: https://www.who.int/news-room/feature-stories/detail/side-effects-of-covid-19-vaccines
8. Coronavirus disease (COVID-19): Vaccines safety [Internet]. Who.int. [cited 2022 Dec 21]. Available from:https://www.who.int/news-room/qadetail/coronavirus-disease-(covid-19)-vaccines-safety
9. CDC COVID-19 Response Team; Food and Drug Administration. Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine - United States, December 14-23, 2020. MMWR Morb Mortal Wkly Rep. 2021 Jan 15;70(2):46-51. doi: 10.15585/mmwr.mm7002e1.PMID:33444297; PMCID: PMC7808711.
10. Azimi M, Dehzad WM, Atiq MA, Bahain B, Asady A. Adverse Effects of the COVID-19 Vaccine Reported by Lecturers and Staff of Kabul University of Medical Sciences, Kabul, Afghanistan. Infect Drug Resist. 2021 Oct 2;14:4077-4083. doi: 10.2147/IDR.S332354. PMID: 34629882; PMCID: PMC8494987.
11. Kow CS, Hasan SS. Potential interactions between COVID-19 vaccines and antiepileptic drugs. Seizure.2021Mar;86:80-81.doi:10.1016/j.seizure. 2021.01.021. Epub 2021 Feb 5. PMID: 33578259; PMCID: PMC7862020.
12. Simnani FZ, Singh D, Kaur R. COVID-19 phase 4 vaccine candidates, effectiveness on SARS-CoV-2 variants, neutralizing antibody, rare side effects, traditional and nano-based vaccine platforms: a review. 3 Bio-tech. 2022 Jan;12(1):15. doi: 10.1007/s13205-021-03076-0. Epub 2021 Dec 12. PMID: 34926119; PMCID: PMC8665991.
13. Elnaem MH, MohdTaufek NH, Ab Rahman NS, MohdNazar NI, Zin CS, Nuffer W, Turner CJ. COVID-19 Vaccination Attitudes, Perceptions, and Side Effect Experiences in Malaysia: Do Age, Gender, and Vaccine Type Matter? Vaccines (Basel). 2021 Oct 9;9(10):1156. doi: 10.3390/vaccines9101156.PMID:34696264; PMCID: PMC8539146.

14. He Q., Mao Q., Zhang J., Bian L., Gao F., Wang J., Xu M., Liang Z. COVID-19 Vaccines: Current Understanding on Immunogenicity, Safety, and FurtherConsiderations. Front.Immunol. 2021;12:669 339. doi: 10.3389/fimmu.2021.669339. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

15. Pfizer-BioNTech COVID-19 vaccine reactions & adverse events [Internet]. Cdc.gov. 2022 [cited 2022 Dec21].Availablefrom:https://www.cdc.gov/vaccines/covid-19/info-by product/ Pfizer /reactogenicity.html

16. Riad A, Pokorná A, Attia S, Klugarová J, Koščík M, Klugar M. Prevalence of COVID-19 Vaccine Side Effects among Healthcare Workers in the Czech Republic. J Clin Med. 2021 Apr 1;10(7):1428. doi: 10.3390/jcm10071428. PMID: 33916020; PMCID: PMC8037149.

17. Centres for Diseases Control and Prevention (CDC) Reactions and Adverse Events of the Pfizer-BioN Tech COVID-19 Vaccine. [(accessed on 7 March2021)]; Availableonline: https://www.cdc.gov /vaccines/covid19/infobyproduct/pfizer/reactogenicity.html.

The Authors:

Dr. Nimrah Komal,
Public Health Scholar,
Department of Public Health,
Health Services Academy, Islamabad.

Mr. Ali Mujtaba,
Department of Management Sciences,
Riphah Int University, Islamabad.

Dr. Muhammad Wajid Munir,
Consultant Medical Specialist,
Isolation Hospital and Infectious Treatment Centre, Islamabad for COVID -19 Patients by NIH

Dr. Aftab Ahmed,
Resident Rheumatologist,
PIMS, Islamabad.

Dr. Syed Abdul Ahad
Medical Student,
Department of Medicine,
Dow University of Health Sciences, Karachi.

Dr. Hassan Mumtaz,
Public Health Scholar,
Department of Public Health,
Health Services Academy, Islamabad.

Dr. Syed Abdul Rehman Shah,
Medical Student,
Department of Medicine,
Dow University of Health Sciences, Karachi.

Corresponding Author:
Dr. Hassan Mumtaz,
Public Health Scholar,
Department of Public Health,
Health Services Academy, Islamabad
hassanmumtaz.dr@gmail.com