Sial Journal of Medical Sciences
ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol. 1, Issue 3, 2023

ADVERSE EFFECTS OF SINOVAC AND SINOPHARM COVID-19 VACCINES SEEN IN UNIVERSITY STUDENTS

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ABSTRACT

OBJECTIVE:

The objective of the study is to demonstrate prevalence and potential predictions for side effects of Sinopharm and Sinovac Chinese vaccines of COVID-19 among MBBS students of SMC.

METHODS:

100 students (male/female) of M.B.B.S with one or two administered doses of Sinopharm and Sinovac were registered.

A Performa including segment on vaccination status and adverse effects was designed. The participants were asked to respond using recall methodology

RESULT:

Of 100 participants, 87 submitted completely filled survey (response rate 87%). After first dose, reports of fever for Sinopharm found to be 24% while for Sinovac 12%. Similarly after second dose side effects reported with pain at the site of injection were 52.3% for Sinovac and 42.3% for Sinopharm. After both first and second doses fever was the most common reported side effect of Sinopharm.

CONCLUSION:

Sinovac covid-19 vaccine is slightly better than Sinopharm in terms of mild short self- manageable side effects.

INTRODUCTION

Researchers grew large stocks of corona virus in monkey kidney cells. Then they doused the viruses with a chemical called beta-propiolactone. The compound disabled the corona virus by bonding to their genes. The inactivated corona virus could no longer replicate, but their proteins including spike remained intact[1].

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On the 1st February 2021, Pakistan received first shipment of Sinopharm vaccine from China2. On the 22nd April 2021, Pakistan received Sinovac vaccine from China[3]. And on the 3rd February 2021, Pakistan began vaccine roll out4. Vaccines available around the globe are;

- CanSino (with 66% efficacy)
- Sinopharm (produced in Beijing with 78% efficacy)
- Sinovac (with efficacy of 51-84%) Bharat (with efficacy of 78%) Gamaleya (with efficacy of 92%)
- Oxford-AstraZeneca (with efficacy of 72-100%) Pfizer (with efficacy of 91%)
- Johnson & Johnson (with efficacy of 64-72%)
- Moderna (with efficacy of 93-98%) Novavax (with efficacy of 90%). [5]

Vaccination is the process of introducing a vaccine into the body which induces protection from a specific disease. A vaccine is a preparation that is used to stimulate the body's immune response against a disease.5 It is usually administered through injections, by mouth or sprayed into the nose. There are different types of vaccines. Such as; [6]

- Inactive vaccines
- Live-attenuated vaccine
- MRNA vaccine
- Toxoid vaccine
- Active vaccine
- Passive vaccine

Active vaccines make antibodies inside the human body whereas in passive vaccines

there are already made antibodies outside of the human body. The latter vaccine provides a faster immune response.

Coronavirus (Covid-19) is a disease caused by the SARS- CoV-2 virus.7 It was first discovered on 31st November 2019.[8] However, COVID-19 was later declared as a pandemic on 11th March, 2020. The initial complications include mild to moderate respiratory problems along with fever, cough, weakness, loss of taste and smell. 8 These signs may appear 2-14 days after exposure. The severity of the virus varies from person to person. Some people may recover quickly and some may continue to have severe symptoms, such as; worsened shortness of breath progressing to death.[9]

Sinovac is an inactivated vaccine.[10] It uses a weakened /deactivated form of the pathogen.[11]

Due to the inactivated form, the vaccine does not infect healthy cells but replicate in human body. It triggers an immune response in the body. The benefit of using inactivated vaccines is that even immuno compromised people can use it, along with pregnant women.[10] According to 17- 21% of people who received the doses of vaccine, reported pain at injection site and soreness.[12] Pain and soreness are considered the most common side effects of almost all the COVID-19 vaccines.

Sinopharm is also an inactivated vaccine. [10] It is a similar vaccine to Sinovac. Side effects after 1st dose include; pain at injection site, fatigue and headache.[13]

Both Sinovac and Sinopharm cause close to similar side effects. These side effects include; pain, tiredness, fever, fatigue, diarrhea & muscle weakness. Some other effects include; itching, swelling, inflammation & raised bumps.[12]

METHODOLOGY

The present cross-sectional performa based study was conducted between 13th September and 13th October, 2021 at Sialkot Medical College, Sialkot. The students belong

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to different ethnicity and socioeconomic classes of far-flung geographical areas of Pakistan were included.

A sample size of 100 students was set considering recommended range for any pilot study. The Sialkot Medical College (a private institute) was selected from a pool of three medical colleges (one public and two private) located at Sialkot city purposively. Within the SMC, all the levels of MBBS (1st to 5th professional) were considered before registering their all students. The students (male or female), aged >18 years with at least one dose of vaccine Sinopharm or Sinovac were enrolled. However, all those who had previous report of COVID positive, or got short of vaccine other than the under-study vaccines, any serious physical or mental issue less than 15 days since last shot of vaccine and/or showed no consent to participate in the study, were excluded before final recruitment.

A performa including segment on vaccination status and adverse effects was designed (by team of linguistic experts and epidemiologists). There were two to many options against each of the attributes to tick the appropriate one. The performa was administered to finally recruited 100 participants through simple random selection during college hours and students were asked to response it in open time and stress-free mood.

The study was conducted after getting clearance from the college and ethics committee. Similarly, participation consent of the participants was obtained before recruitment. The data from the performa was entered in the sheet of SPSS 28.0.0.

RESULTS

Out of 100 participants, 87 submitted completely filled surveys with female predominance: n= 63, males being n= 24 (Figure-I). However, (n=13) of the participants were reluctant to provide their demographic information. All participants under study had been fully vaccinated i.e., they have had taken both doses of the vaccine. Age of the participants' ranges from 18 years to 25 years with mean age being 20.9 years. (n=45) of the participants got the Sinopharm vaccine while (n=65) got Sinovac vaccine (Figure-2). After the first dose of the vaccine, reports of fever were found to be 24% from Sinopharm while 12% from Sinovac (as seen in table 1a). Tiredness was shown more (36.9%) by Sinovac as compared to (26.6%) Sinopharm. There were almost equal complaints of aches & pains and headache by both the vaccines. Pain at the site of injection being the most prevalent complaint seen by (53.8%) Sinovac than Sinopharm (44.4%).

Similarly, after second dose effects were also reported as pain at the site of injection being the most prevalent i.e., 52.3% for Sinovac and 42.2% for Sinopharm {as seen in table 1b}. Fever, tiredness, aches, pains and headache were among the common symptoms reported by the participants. Fever was seen more in Sinopharm (22%) than in Sinovac (15%) as it was seen after first dose. However, tiredness and aches & pains were seen equally in both vaccines. Headache was slightly more in (26.6%) Sinopharm than in (12.3%) Sinovac.

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Table 1a: Showing Symptoms After First Dose

SYMPTOMS	SINOPHARM	SINOVAC
Fever	11	08
Cough	04	02
Tiredness	12	24
Aches & Pain	13	18
Sore Throat	01	02
Headache	11	13
Loss of Taste & Smell	01	00
Shortness of Breath	01	02
Pain at the site of Injection	20	35
Dizziness	05	07
Nausea	05	02
Vomiting	00	01
Chest Pains	00	02
Other Side Effects	02	00

Table 1b: Showing Symptoms After Second Dose

SYMPTOMS	*SINOPHARM*	*SINOVAC*
Fever	10	10
Cough	03	02
Tiredness	14	21
Aches & Pains	09	15
Sore Throat	04	02
Headache	12	08
Loss of Taste & Smell	00	02
Pain at the site of Injection	19	34
Dizziness	08	06
Nausea	03	02
Vomiting	02	01
Chest Pains	01	00
Shortness of Breath	01	00
Other Side Effects	01	01

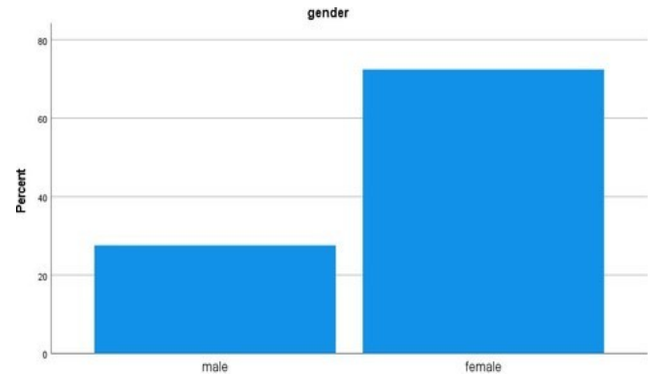

Figure 1: Showing bar chart diagram of Gender Distribution.

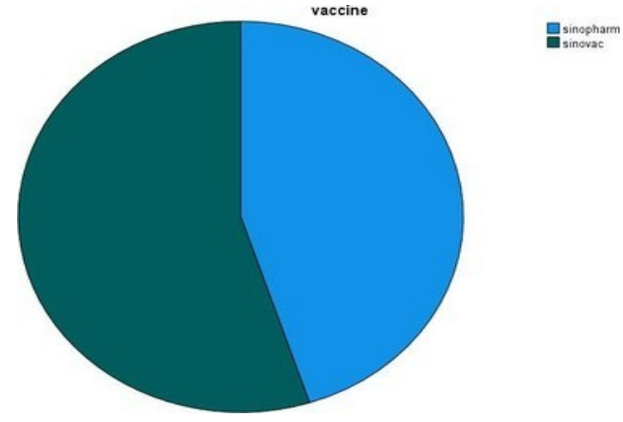

Figure-2: showing a pie chart diagram of frequencies of vaccines.

DISCUSSION

The Beijing - based biopharmaceutical company Sinovac is the manufacturer of CoronaVac, which is an inactivated vaccine. It works by using killed viral particles to expose the human body's immune system to the virus without risking a serious disease response.[14] Sinopharm, a Chinese state-owned company, is developing two Covid-19 vaccines, which are also inactivated vaccines. Chinese vaccine got 'successful in mid-stage trials'.

Talking about trial results of Sinovac; One Chinese study published in scientific journal “The Lancet”, which has information from the first and second phase trials of

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Coronavac having efficiency from 50% to 78%. Sinopharm announced on 30th December, 2020 that phase three trials of the vaccine showed that it was 79% effective, lower than that of Pfizer and Moderna. Vaccine leader China already inoculating workers and showing that Chinese vaccine is 'successful in mid-stage trials' 2020, Trials 1 and 2 of the Sinopharm vaccine were completed and showed that the vaccine triggered a COVID-19 neutralizing antibody response with a low rate of adverse reactions. The most common adverse reactions were pain at the injection site and fever, but all were mild and self-limiting. Moreover, no treatment was required for any side effect.[15]

The UAE was among the first to conduct phase 3 clinical trials of the vaccine, which found the vaccine to have good results. Most studies have assessed post-vaccination adverse reactions of the Pfizer–BioNTech, Moderna, and AstraZeneca vaccines.[16,17,18,19] while only 2 studies focused on the Sinopharm COVID-19 vaccine. [20] Sinovac efficacy for preventing infection was 51% in Brazil, 67% in Chile, 65% in Indonesia, and 84% in Turkey.

Sinopharm's efficacy in preventing symptomatic infection was 78% in UAE, Bahrain, Egypt and Jordan combined. In our study, 45% of the participants got the Sinopharm vaccine while 65% got Sinovac vaccine. There were no significant side effects related to these two vaccines that require special attention.

After both first and second doses, fever was reported by more people vaccinated by Sinopharm. Injection site pain was seen more in Sinovac than in Sinopharm after both doses. Vaccine hesitancy Rate was very high. This study showed that first and second dose after vaccination adverse reaction of Sinovac and Sinopharm COVID- 19 vaccine were common side effects that were mild, predictable, non-serious and non- life threatening to our knowledge.

Another study showing post-vaccination side effects of Sinopharm was conducted by University of Sharjah, UAE. A quarter of participants reported they did not have any symptoms after first vaccination shot while had mild symptoms following vaccination. For the second dose, 14% of participants did not report symptoms; however, the majority had mild and predictable side effects. None of the side effects were severe or required hospitalization.[21]

This study's findings are in accordance to our study that no significant symptoms are reported. But in our study, it has been evaluated that fever is more with Sinopharm and pain at injection site is more with Sinovac.

CONCLUSION:

Both vaccines, Sinopharm and Sinovac, had not shown any significant side effects. There was slightly more association of fever with Sinopharm and pain at injection site is more reported with Sinovac.

REFERENCES

1. Corum J., and Zimmer C., 4th August 2021, The New York Times, accessed 2nd December 2021. https://www.nytimes.com/interactive/2020/health/sinopharm-covid-19-vaccine.html
2. https://www.aljazeera.com/news/2021/2/1/pakistan-receives-first-shipment-of-corona…
3. https://tribune.com.pk/story/2296193/pakistan-receives-05m-doses-of-sinovac-shots-from.
4. Junaidi I., Dawn News, February 3,

2021, accessed 2nd December 2021 https://www.dawn.com/news/1605205

5. Centers for Disease Control and Prevention, 2021, 1st September. Centers for Disease Control and Prevention. Retrieved December 2, 2021, from https://www.cdc.gov/vaccines/vac-gen/imz-basics.htm.
6. Office of Infectious Disease and HIV/AIDS Policy (OIDP). (2021, May 4). Vaccine types. HHS.gov. Retrieved December 2, 2021, from https://www.hhs.gov/immunization/basics/types/index.html.
7. World Health Organization. (n.d.). Coronavirus. World Health Organization. Retrieved December 2, 2021, from https://www.who.int/health-topics/coronavirus#tab=tab_1.
8. World Health Organization. (2021, December 2). About the virus. World Health Organization. Retrieved December 2, 2021 https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov#:~:text=On%2031%20December%202019%2C,2019%2DnCoV.
9. Mayo Foundation for Medical Education and Research. (2021, December 1). Coronavirus disease 2019 (covid-19). Mayo Clinic. Retrieved December 2, 2021 https://www.mayoclinic.org/diseases-conditions/coronavirus/symptoms-causes/syc-20479963.
10. World Health Organization. (n.d.). The SINOVAC-CoronaVac covid-19 vaccine: What you need to know. World Health Organization. Retrieved December 2, 2021, from https://www.who.int/news-room/feature-stories/detail/the-sinovac-covid-19-vaccine-what-you-need-to-know.
11. The four types of COVID-19 vaccine – A Snapshot. Healthcare IT News. (2021, February 18). Retrieved December 2, 2021. https://www.healthcareitnews.com/news/emea/four-types-covid-19-vaccine-snapshot.
12. Zimlich, R. (2021, May 14). AstraZeneca vs. Sinovac vaccines: Effectiveness, side effects.Healthline Retrieved December 2, 2021, https://www.healthline.com/health/astrazeneca-vs-sinovac#side-effects.
13. Saeed BQ; Al-Shahrabi R; AlhajSS; AlkokhardiZM;Adrees AO; (n.d.). Side effects and perceptions following Sinopharm covid-19 vaccination. International journal of infectious diseases: IJID: official publication of the International Society for Infectious Diseases. Retrieved December 2, 2021, from https://pubmed.ncbi.nlm.nih.gov/34384 899.
14. Yvette Tan, 14th January 2021, BBC, accessed 3rdDecember 2021 <https://www.google.com.pk/amp/s/www.bbc.com/news/world-asia-china-55212787.amp>
15. Clinical Sciences Department, College of Medicine, University of Sharjah, Sharjah, UAE, 9th August 2021, NCBI, accessed 3rd December 2021. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8351310/>
16. Nagla A El-Shitany, Steve Harakeh, and Manal El-Hamamsy. 19th April 2021, NCBI, accessed 3rd December 2021. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8068468/?report=reader>

17. Johanna Chapin-Bardales, PhD, MPH; Julianne Gee, MPH; Tanya Myers, PhD, MSc, 5th April 2021, Jama Network, accessed on 3rd December 2021.

<https://scholar.google.com/scholar_lookup?journal=JAMA&title=Reactogenicity+Following+Receipt+of+mRNA-Based+COVID-19+Vaccines&author=J+Chapin-Bardales&author=J+Gee&author=T.+Myers&volume=325&issue=21&publication_year=2021&pages=2201-2202&pmid=33818592&doi=10.1001/jama.2021.5374>

18. Renuka A.K. Kadali, RavaliJanagama, Sharanya Peruru, and Srikrishna V. Malayala, 15th April 2021, NCBI, accessed 3rd December 2021.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8049195/?report=reader>

19. Department of Public Health, Faculty of Medicine, Masaryk University, Kamenice 5, 625 00 Brno, Czech Republic, 1st April 2021, JCM, accessed 3rd December 2021.

<https://scholar.google.com/scholar_lookup?journal=J.+Clin.+Med.&title=Prevalence+of+COVID19+Vaccine+Side+Effects+among+Healthcare+Workers+in+the+Czech+Republic.+2021&author=A+Riad&author=A+Pokorná&author=S+Attia&author=J+Klugarová&author=M+Koš˘cC3%ADk&volume=10&publication_year=2021&pages=1428&pmid=33916020&>

20. Ma'mon M. Hatmal, Mohammad A. I. Al-Hatamleh, and Rohimah Mohamud, 26th May 2021, accessed 3rd December, 2021.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8229440/?report=reader>

21. Covid 19 Awareness guide April 2021, Dubai Health Authorit, accessed 3rd December 2021.

<https://www.dha.gov.ae/Asset%20Library/COVID19/Covid19_Vaccine_EN.pdf>