Evaluation of COVID-19 Vaccines Side Effects among Staff and Students of Misurata University in Libya

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Article Info

Key word:
COVID-19
vaccination
side effect
Libya
Misrata

Article history:
Received: 10/02/2022
Revised: 08/03/2022
Accepted: 09/03/2022

ABSTRACT

After a year of COVID-19 being distributed in all countries worldwide, several COVID-19 vaccines were invented by different companies. All of these vaccines obtained emergency approval from WHO because of critical conditions to fight this pandemic, but still, scientists work on clinical experiments to approve the safety of these vaccines and their adverse effects. This research tried to check the safety of vaccines imported from the Libyan Health Ministry. The comparison was among Sinovak, Sinopharm, AstraZeneka, Sputnik V, and Pfizer- BioNTech vaccines. The research aimed to compare the side effects of each vaccine after 24 hours of vaccination, this information was collected from people who work or study at Misurata University. The first notice of survey results was the small number of people who took the second dose of all vaccines, even if all second doses have been provided by the health ministry with the exception of sputnik V. Most side effects were clear in sputnik V, AstraZeneka, and Pfizer- BioNTech, on the other hand, Sinopharm and Sinovac were mostly with little side effects although some people had headache and fever. This research recommends for more action forward campaign that aims to convince Libyan people to get COVID-19 vaccines.

Introduction

After the first reported case of COVID-19 in December 2019 in Wuhan, China, the pandemic was distributed around the world without exceptions. In Libya, the first case was reported on 24/3/2020, and cases took two months to start increasing remarkably (Gasibat, Raba, & Abobaker, 2020). After more than a year from the first case, the second wave of COVID-19 started to attack on July 2021, it was strong compared with the first wave (https://ncdc.org.ly/Ar/). Fortunately, the tough wave came when already a lot of invented vaccines have been approved (Gulati et al, 2020): Mao et al, 2021). Furthermore, some approved vaccines such as Sinovak and Oxford/AstraZeneka COVID-19 are already imported by the Libyan government, but with a small amount that targeted only hospitals staff and older people. The second move of the National Center for Disease Control in Libya (NCDC) to accelerate the vaccination inside the country was by contract with other companies who produce COVID-19 vaccines, by this step they could import other brands of vaccines such as Sputnik V, Sinopharm, and Pfizer-BioNTech's COVID-19 vaccine (Meo et al., 2021).

According to NCDC report which was published on 5/8/2021, Libya is still classified at the community spread stage. Where total cases reached 264827 cases, and 3659 death cases. Meanwhile, the recovered cases were 197563 cases according to the new protocol that was approved by (NCDC). The conclusion of (NCDC) report mention that the country is experiencing enhancement of epidemiological situation, and advised the people to take the vaccine against COVID-19 (Abu-Hammad et al., 2021; Zhang et al., 2021).

To date, the number of people who were vaccinated with the first dose is 1,266,669 people and only 145,217 people received the second dose. These data were recorded on 15/9/2021 on the website of (NCDC) (Lazarus et al., 2021).

Even if the cases of infected people were decreased, the number of vaccinated people with a second dose is still low in the country with a population estimated at 6.8 million (Libya, Data, 2009). The low number is due to the delay in providing the second dose to vaccination centers as well as rumors spread in the community about the safety of the vaccines.

In this research, we tried to do a social survey to compare the adverse effects among COVID-19 vaccines that are used in Libya. The research was applied at Misurata University, in Misrata city in Libya. The survey targeted both students and university staff in the university. The questionnaire asked about what side effects they were experiencing after 24 hours of taking the vaccine, whether it was first or second dose. This research provides multiple choice of familiar side effects that reported for COVID-19 vaccines which were reported in previous studies (Djanas et al., 2021).

Materials and Methods

This research applied using a cross-sectional method to determine COVID-19 vaccines' side effects among students and staff of Misurata University. The survey of this research was started on 1/9/2021 and the data was collected on 25/9/2021. The questionnaire was nameless and was distributed randomly on the campus, and it was consists of five closed-ended questions on age, gender, type of vaccine, if individuals suffering from any type of chronic disease, and side effects experienced after the first or second dose of the vaccine. The questionnaire is provided as a supplementary file.

Results and Discussion

Results

The survey data were collected from 238 students and university staff at Misurata University. The characteristics of the participants are presented in Table 1. Meanwhile, the side effects of the second dose of COVID-19 vaccines were shown in Table 2.

Table 1. Characteristics of the survey participants

Variable		Dose 1 Recipients Total (238)	Dose 2 Recipients Total (15)	Both Doses Recipients %
Gender	Male	116 (48.74%)	9 (60%)	7.76%
	Female	122 (51.26%)	6 (40%)	4.92%
Age	18 – 24	81 (34.03%)	3 (20%)	3.70%
	25 – 34	46 (19.33%)	4 (26.67%)	8.70%
	35 – 44	32 (13.45%)	2 (13.33%)	6.25%
	45 – 54	32 (13.45%)	1 (6.67%)	3.13%
	55 – 64	37 (15.55%)	2 (13.33%)	5.41%
	65 ≤	10 (4.20%)	3(20%)	30%
Vaccine types	Pfizer- BioNTech (PB)	12 (5.04%)	3 (20%)	25%
	Oxford AstraZeneka (AZ)	40 (16.80%)	9 (60%	22.5%
	Sinopharm (Sp)	28 (11.76%)	-	-
	Sinovac (Sv)	21 (8.82%)	1 (6.67%)	4.76%
	Sputnik V (Sn)	137 (57.56%)	2 (13.33%)	1.46%

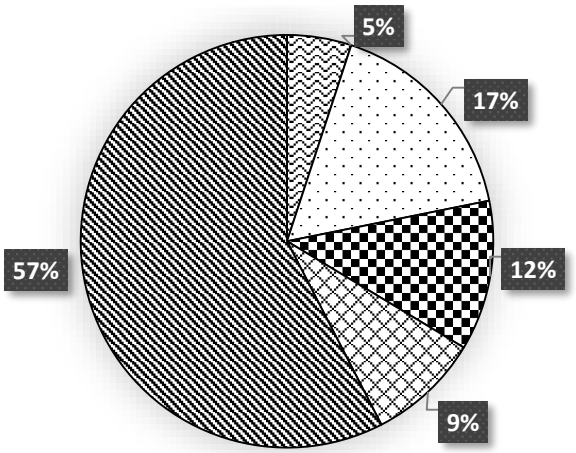

Figure 1. The percentages of each vaccine were collected from the survey. Oxford AstraZeneka (AZ), Sinopharm (Sp), Sinovac (Sv), Sputnik V (Sn), Pfizer-BioNTech (PB)

Discussion

Although, the second doses have been available, until the date of this research and according to the survey results, it was clear that most people did not take the opportunity to receive a second vaccine dose, which was clear that only 15 people had the second dose, even if the survey targeted high educated people. Although the number of people receiving each type of vaccine is dissimilar, the results were as expected compared with previous studies. Sputnik V and AstraZeneka caused the highest side effect (Babamahmoodi, Saeedi, & Navaei, 2021)(Menni et al., 2021). On the other hand, Chinese vaccines (Sinovac and Sinopharm) showed the lowest side effects and showed no significant side effects. Still, Pfizer- BioNTech has moderate side effects (Table 2 and Figur 1).

Despite, the enormous variance of side effects of each vaccine, all vaccines share some familiar side effects such as fever and headache including the Sinovac vaccine. Although, there was a small number of individuals who receive the booster dose of vaccination, nevertheless the results showed no difference of side effects between first and second dose.

Obviously, there was no difference between males and females of side effect appearance, which means there is no relationship between gender of individuals and vaccines side effects (Soiza, Scicluna, & Thomson, 2021). Moreover, the side effect of vaccines for older individuals was not significantly different from those under 20 years old (Table 1). All side effects were moderate and acceptable, and we assumed that all vaccines are safe to use whatever the gender or age. Fortunately, the vaccine that has most side effects (Sputnik V) is no longer available in the vaccination center in Libya, and the government was directed to provide vaccination centers with Sinopharm and AstraZeneka, due to their efficacy and safety reports (Menni et al., 2021). Furthermore, until the date of collecting the research data, it is obvious that Libyan people still hesitate to receive the second dose of COVID-19 vaccines.

Table 2. Results of vaccines side effects

Side effects	Vaccine Types					Total
	PB (%)	AZ (%)	Sp (%)	Sv (%)	Sn (%)	(%)
Side effects	10 (83.34%)	25(62.50%)	10(35.71%)	6(28.57%)	85(62.04%)	136(57.14%)
No Side effects	02(16.67%)	15(37.50%)	18(64.29%)	15(71.43%)	52(37.96%)	102(42.86)
Hypersensitivity						
Yes	00 (00%)	00 (00%)	00 (00%)	00 (00%)	00 (00%)	00(00%)
No	12 (100%)	40 (100%)	28(100%)	21(100%)	137(100%)	238(100%)

Table 2. Continue

Side effects	Vaccine Types					Total (%)
	PB (%)	AZ (%)	Sp (%)	Sv (%)	Sn (%)	
Non severe allergic reactions						
Yes	00 (00%)	00 (00%)	00 (00%)	00 (00%)	00 (00%)	00(00%)
No	12 (100%)	40 (100%)	28(100%)	21(100%)	137(100%)	238(100%)
Injection site pain						
Yes	04(33.33%)	09(29.03%)	04(14.28%)	02(9.52%)	44(32.11%)	63(26.47%)
No	08(66.66%)	31(70.97%)	24(85.72%)	19(90.48%)	93(67.89%)	175(73.53%)
Injection site swelling						
Yes	00(00%)	01(2.50%)	00(00%)	00(00%)	19(13.87%)	20(8.40%)
No	12(100%)	39(97.50%)	28(100%)	21(100%)	118(86.13%)	218(91.60%)
Headache						
Yes	05(41.67%)	09(22.50%)	05(17.86%)	03(14.29%)	55(40.15%)	77(32.35%)
No	07(58.33%)	31(77.50%)	23(82.14%)	18(85.71%)	82(59.85%)	161(67.65%)
Myalgia						
Yes	03(25%)	07(17.50%)	01(3.57%)	00(00%)	23(16.79%)	34(14.29%)
No	09(75%)	33(82.50%)	27(96.43%)	21(100%)	114(83.21%)	204(85.71%)
Chills						
Yes	00(00%)	04(10%)	00(00%)	00(00%)	13(9.49%)	17(7.14%)
No	12(100%)	36(90%)	28(100%)	21(100%)	124(90.51%)	221(92.86%)
Joint pain						
Yes	04(33.33%)	05(12.50%)	00(00%)	00(00%)	18(13.14%)	27(11.34%)
No	08(66.66%)	35(87.50%)	28(100%)	21(100%)	119(86.86%)	211(88.66%)
Vomiting						
Yes	00(00%)	01(2.50%)	00(00%)	00(00%)	05(3.65%)	06(2.52%)
No	12(100%)	39(97.50%)	28(100%)	21(100%)	132(96.35%)	232(97.48%)
Chest pain						
Yes	00(00%)	02(05%)	00(00%)	00(00%)	05(3.65%)	07(2.94%)
No	12(100%)	38(95%)	28(100%)	21(100%)	132(96.35%)	231(97.06%)
Palpitation						
Yes	00(00%)	00 (00%)	02(7.14%)	00(00%)	04(2.92%)	06(2.52%)
No	12(100%)	40 (100%)	26(92.86%)	21(100%)	133(97.08%)	232(97.48%)
Other Symptoms						
Yes	00(00%)	01(2.50%)	00(00%)	00(00%)	03(2.19%)	4(1.68%)
No	12(100%)	39(97.50%)	28(100%)	21(100%)	134(97.81%)	234(98.32%)
Fatigue						
Yes	02(16.67%)	11(27.50%)	05(17.86%)	02(9.52%)	61(44.53%)	81(34.03%)
No	10(83.33%)	29(72.50%)	23(82.14%)	19(90.48%)	76(55.47%)	157(65.97%)
Fever						
Yes	04(33.33%)	05(12.5%)	04(14.29%)	02(9.52%)	49(35.77%)	64(26.89%)
No	08(66.66%)	35(87.50%)	24(85.71%)	19(90.48%)	88(64.23%)	174(73.11%)
Injection site Redness						
Yes	00(00%)	00 (00%)	01(3.57%)	00(00%)	15(10.95%)	16(06.72%)
No	12(100%)	40 (100%)	27(96.43%)	21(100%)	122(89.05%)	222(93.28%)
Nausea						
Yes	00(00%)	01(2.50%)	00(00%)	00(00%)	08(5.84%)	09(03.78%)
No	12(100%)	39(97.50%)	28(100%)	21(100%)	129(94.16%)	229(96.22%)
Felling Unwell						
Yes	02(16.67%)	02(05%)	03(10.71%)	00(00%)	08(5.84%)	15(6.30%)
No	10(83.33%)	38(95%)	25(89.29%)	21(100%)	129(94.16%)	223(93.70%
Lymphadenopathy						
Yes	00(00%)	00 (00%)	00(00%)	00(00%)	01(0.73%)	01(0.42%)
No	12(100%)	40 (100%)	28(100%)	21(100%)	136(99.27%)	237(99.58%)

Table 2. Continue

Side effects	Vaccine Types					Total (%)
	PB (%)	AZ (%)	Sp (%)	Sv (%)	Sn (%)	
Diarrhea						
Yes	00(00%)	01(2.50%)	01(3.57%)	00(00%)	06(4.38%)	08(3.36%)
No	12(100%)	39(97.50%)	27(96.43%)	21(100%)	131(95.62%)	220(96.64%)
Arm pain						
Yes	02(16.67%)	05(12.50%)	06(21.43%)	02(9.52%)	29(21.17%)	44(18.49%)
No	10(83.33%)	35(87.50%)	22(78.57%)	19(90.48%)	108(78.83%)	194(81.51%)
Shortness of breath						
Yes	00(00%)	01(2.50%)	01(3.57%)	00(00%)	04(2.92%)	06(2.52%)
No	12(100%)	39(97.50%)	27(96.43%)	21(100%)	133(97.08%)	232(97.48%)

Conclusion

The comparison was among Sinovak, Sinopharm, AstraZeneka, Sputnik V, and Pfizer- BioNTech vaccines, of the survey results was the small number of people who took the second dose of all vaccines, even if all second doses have been provided by the health ministry with the exception of sputnik V. Most side effects were clear in sputnik V, AstraZeneka, and Pfizer- BioNTech, on the other hand, Sinopharm and Sinovac were mostly with little side effects although some people had headache and fever.

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