Safety and efficacy of vaccines against Covid-19 in Nineveh Governorate – Iraq

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Abstract

Background. 518 vaccinated people with three types of vaccines were studied . Most of them received Pfizer vaccine with simple side effects and others sever from headache and fever.

Objective. We aims to know effectiveness of vaccines against Covid 19 and their side effects on adults.

Methods. A questionnaire was adopted from June 2021 to January 2022 and the data was obtained by interviewing people physically, checking the vaccine cards and personal information, and then analyzing the collected data statistically.

Results. The most age group that received the vaccine is (36-50) years, and the most used vaccines were Pfizer (86.4%), followed by AstraZeneca (8.5%), and finally Sinopharm (5.4%). The effectiveness rate of vaccines based on the number of infections after vaccination was (90.1%) for Pfizer, (86.4%) for AstraZeneca, and 78.6% for Sinopharm. The vaccinated people continued the preventive and sterilization measures, with a percentage of (31.3%) completely and (49.4%) partially.

Conclusion. The vaccines used are Pfizer, AstraZeneca, and Sinopharm, the most age group in the sample is (36-50) years and the least is (more than 50) years. All vaccines had mild side effects after vaccination. The most

effective vaccines are Pfizer, then AstraZeneca, and finally Sinopharm. A large proportion of the vaccinated adhered to the preventive and sterilization measures completely or in part.

Keywords: Covid-19 Vaccines, Effectiveness, Type of vaccine, Vaccine safety

Introduction:

Coronavirus infection spread in the Chinese city of Wuhan in December 2019 and then spread in China and abroad, and the World Health Organization officially named the disease on February 12, 2020, which is COVID-19. In a study of patients with pneumonia, radiologists have understood that the clinical examination of the chest and computed tomography (CT) scans are vital for early diagnosis and assessment of the course of the disease. Emphasis was placed on the etiology, epidemiology, and clinical symptoms of Covid-19, highlighting the role of computerized tomography in the prevention and control of diseases [1]. The spread of Covid-19 has led to huge human and economic losses worldwide, and studies are still focusing on how to control the disease at the third level of infection. Some countries publish data and reports on the effectiveness and safety of developed vaccines used against SARS, but the important thing is to find an effective and safe vaccine for more societies against COVID-19 to eradicate the epidemic [2]. The coronavirus that causes Covid-19 disease is the seventh known of the group of coronaviruses that cause lung diseases in humans, and much remains unknown about SARS disease. Physicians and researchers have begun to publish the results and data of their studies about this group of viruses in humans and animals that can transmit the disease. Discussions that focused on the discover, spread, and pathogenicity of the virus and clinical signs of the disease were absorbed, leading to immunological treatments and other treatments, and then developing the appropriate vaccine [3].

As a result of the covid 19 pandemic, various detailed efforts have been made to support the development of an appropriate vaccine, and there are various projects under development, including the clinical evaluation stage at the third level of infection. The goal is to prepare studies that contribute to the development of research in the future, and the main purpose is the benefit of societies [4]. The symptoms of the disease begin 14 days after

exposure to infection, but most of them begin after 4-5 days in all age groups. These symptoms are similar to the symptoms of SARS, and there are no distinguishing features of Covid-19, but it can develop after the first week, for complications to reach the lower part of the respiratory system, studies focus on resistance to this virus, starting with virology, epidemiology, clinical trials, and follow-up treatment to obtain the right options [5]. Since the emergence of the Covid-19 epidemic in 2020, 250 projects have been launched to develop vaccines against the disease, but only 14 of them have been authorized to use. Several studies were conducted on the used vaccines, including mode of action, dose and plan, age groups, side effects, storage conditions, immune response, and cost. There are seven types of vaccines developed against SARS, such as live attenuated vaccines, inactivated viruses, protein subunits, virus-like and researchers' concerns center on the long-term protection provided by vaccines, their side effects, and whether they require future modifications to be effective against mutated variants to control Covid-19 worldwide [6].

The idea of giving the SARS vaccine was applied in many countries to verify its effectiveness against Covid-19, and the results proved its effectiveness, including reducing the risk of infection and complications, especially from the second level for people with chronic diseases [7,8]. It takes about 10-15 years to manufacture any new vaccine, but the spread of the Covid-19 epidemic around the world led to the doubling of efforts and shortening the duration of the vaccine development cycle guaranteed by clinical trials to about 10-14 months with good data on the development of two vaccines in India [9]. The development of vaccines against Covid-19 is of paramount importance, in addition to people's dependence mainly on containment and hygiene measures. Approval of 13 vaccines has been obtained for application, and 90 vaccines are still candidates for clinical trials. Studies are currently focused on the efficiency of vaccines, their interactions, storage mechanisms, and appropriate doses. Emphasize the continuation of spacing and sterilization procedures until a safe and effective vaccine is reached for everyone [10].

The U.S. Food and Drug Administration has granted permission to use the Pfizer, Biotech, and Moderna vaccines against Covid-19, as these vaccines can protect against SARS syndrome by producing antibodies, but they may cause various side effects, especially when vaccinated with the Moderna vaccine. Two vaccines, have simple side effects but Moderna is preferred from a practical point of view for its ease of transportation and storage, in

addition, it bears temperatures more than the previous two vaccines [11]. Taking two doses of the BNT162b2 vaccine gave (95%) protection against Covid-19 in people over 16 years old. The results of the response were clear after two months and are similar to the rest of the antiviral vaccines [12]. Vaccination with a single dose of BNT162b2 or chAdOx1-s vaccine was accompanied by a significant decrease in the symptoms of Covid-19 in the elderly, as it had additional protection from critical cases of the disease. Both vaccines showed similar effects, and their effectiveness was confirmed after follow-up, especially after six weeks from the date of the first dose. There was additional protection and immunity after taking the second dose [13].

To stop the spread of Covid-19, high coverage of the SARS vaccine must be carried out, in a study conducted in Mozambique on the people's acceptance of vaccines and among the youth group, most of the respondents to the vaccination were health care workers. As for the rest of the groups, they were reluctant to take the vaccine for various reasons, including their belief that the vaccine was ineffective, chronic diseases, or fear of re-infection [14]. Pfizer and AstraZeneca recently launched vaccines to stop the spread of Covid-19 through clinical studies, it was found that mild side effects appeared after taking the vaccine. In most cases, the side effects of the two vaccines do not exceed the pain in the glaucoma site, which indicates the safety of the two vaccines. This corresponds to clinical trial reports. More studies are required to evaluate the effectiveness of other vaccines [15]. Despite the provision of good protection by Covid-19 vaccines, it does not give complete immunity, however, it significantly reduces transmission of the virus, and in two studies conducted in the United Kingdom on the transparency of data taken from vaccinators, it was found that sample members are still in doubt about the benefit of the vaccine or Side effects or the extent of protection it provides [16].

A statistical study was conducted in the United Arab Emirates on the side effects of the Sinopharm vaccine, and data taken from vaccinators over the age of 49 years proved that the usual effects are tingling pain and headache, which gradually disappear [17]. Studies and clinical trials that were conducted to evaluate the effectiveness of Pfizer and Moderna vaccines showed that the vaccines reduced the possibility of recurrence of infection as well as reduced and reduced subsequent complications, despite the lack of understanding of the health staff and the general public at the beginning of the content of the data and reports obtained from clinical trials. However, the real results indicated the effectiveness of those vaccines with a statistically high significant

difference [18]. Despite the effectiveness of Covid-19 vaccines on different groups of people, the experiments showed a weak response in people with type 1 and type 2 diabetes, but the positive and statistically significant thing was equal to the production of antibodies in diabetics, and the effectiveness and safety of vaccines for children under eighteen and pregnant and lactating women need further study and follow-up [19].

Most of the Covid-19 vaccines are safe and effective, especially for the elderly, with the exception of the AstraZeneca vaccine, as the data gave a strong response to them and led to the lack of recurrence of infection, especially for those infected with the second level of the disease. The experiments also showed that the Pfizer and Moderna vaccines had great effectiveness for the infected, but who did not suffer from chronic diseases or weak immunity, and it is better to vaccinate the elderly and the medical and health cadres that provide services to them, as well as the primary health care cadres [20]. A study conducted on the elderly in Germany showed that the percentage of those who accepted the vaccine was encouraging with regard to the positive aspects such as not a recurring infection or reducing the risk of complications. Increasing the effectiveness of vaccines and reducing their side effects remain important factors in the future to convince people to receive vaccinations [21].

The booster dose with m RNA vaccines was given to a number of adults in England at the end of 2021 by compare the negative cases design as a control group to compare with the effectiveness of the given dose of (Pfizer – BioNTech) six months after the second dose. The effectiveness was excellent for all age groups and for both groups from the seventh day to the eleventh after receiving the third dose [22].

Aim of the Study:

Evaluation of vaccines efficacy and safety on adults.

Material and Methods:

A special questionnaire was prepared from June 2021 to January 2022. Samples were taken randomly from those vaccinated in Nineveh Governorate – Iraq. According to the type of vaccines provided by the Iraqi Ministry of Health in that period , the Pfizer vaccine was preferred by most people because the media focus on this type ,and people thought that Sinopharm vaccine is ineffective. Data was collected by interviewing the sample members, checking the vaccine cards and other personal information, the effect of the vaccination was recorded by following

up on each vaccine after 3 months of the first dose and recorded the symptoms that appeared on them, and so on after the second dose and then the two doses, and then conducting a statistical analysis. We aims to know the efficacy and safety of vaccines as a general not individually.

The Results:

This study was conducted on 518 individuals, 270 (52.1%) males and 248 (47.9%) females. The number of vaccinated people from the age group (18-35) was 202 (39%) and the group (36-50) is 236 (45.6%). The category (over 50 years old) is 80 (15.4%), as shown in Table (1).

Table No. (2) shows that the number of people vaccinated with Pfizer 446 (86.1%), AstraZeneca 44 (8.5%), and Sinopharm 28 (5.4%). As for the side effects of the vaccine after the first dose, mild symptoms appeared, represented by headache, fever, and lethargy. It gradually disappeared within a day or two after receiving the first dose of the three vaccines for 404 (77.9%), after the second dose for 392 (75.7), and after the two doses for 367 (78.8%), as shown in Table (3).

Regarding the reasons for taking the vaccine, Table No. (4) indicates that 100 (19.3%) of the vaccinated were personally convinced of the effectiveness and importance of the vaccine. While 270 (52.1%) answered that they had received the vaccine to avoid infection and 102 (19.7%) Intensive health instructions were a reason for them to accept the vaccine, while only 46 (8.9%) were afraid of imposed procedures on non-vaccinators.

The study showed that the number of those who were previously infected and received vaccinations is 224 (43.2%), and 294 (56.8%) had not previously contracted the disease. The study showed through Table No. (5) that 56 (10.8%) of those who received the vaccines were exposed to the infection again after three months of vaccination. Moreover, 462 (89.2%) did not show any symptoms of infection after three months. According to the name of the given vaccine, the number of those who were not exposed to infection after receiving the Pfizer vaccine was 402 (90.1%). The vaccinated with AstraZeneca is 38 (86.4%), for those vaccinated with Sinopharm, the number was 22 (78.6%).

Regarding the personal behavior and health habits, the study showed that 162 (31.3%) of the vaccinated continued the sterilization and prevention procedures, 100 (19.3%) did not adhere to these procedures after receiving the vaccine, and 256 (49.4%) said that they adhered to some extent as shown in the table No. (6).

Table No. (1) Number of vaccinated by age group and sex:

Age group	Male	%	Female	%	Total	%
18-35	136	26.3	66	12.7	202	39.0
36-50	104	20.1	132	25.5	236	45.6
more than 50	30	5.7	50	9.7	80	15.4
Total	270	52.1	248	47.9	518	100

Table No. (2) Number of vaccinated by type of vaccine:

Vaccine type	Number	%
Pfizer	446	86.1
AstraZeneca	44	8.5
Sinopharm	28	5.4
Total	518	100

Table No. (3) Side effects(include headache, fever ,lethargy) that appeared after vaccination:

Dosage	Yes	%	No	%
After first dose	404	77.9	114	22.1
After second dose	392	75.7	126	24.3

After the two doses	367	78.8	88	17.0

Table No. (4) Reasons for taking the vaccine:

Reasons for taking vaccine	Number	%
Personal conviction	100	19.3
Avoid infection	270	52.1
Intensive health tips	102	19.7
Imposed procedures	46	8.9
Total	518	100

Table No. (5) Number of those exposed to infection after vaccination:

Vaccine type	Yes	%	No	%	Total
Pfizer	44	9.9	402	90.1	446
AstraZeneca	6	13.6	38	86.4	44
Sinopharm	6	21.4	22	78.6	28
Total	56	10.8	462	89.2	518

Table No. (6) Personal behavior and health habits after receiving the vaccine:

Commitment to sterilization	Number	%
Yes	162	31.3
No	100	19.3
To some extent	256	49.4
Total	518	100

Discussion:

Although behavioral changes may stem the spread of virus, vaccination will be important to prevent or reduce the additional waves or infection and complications. Several studies of other pathogenic Coronavirus have enabled the rapid design of candidate SARS-CoV-2 vaccines. According to the results of the current study, it appears that the age group (36-50 years) was the most responsive to receive the vaccine. We believe that the reason is that it is the most mature and aware of the risks of infection and the most important in the areas of community work, and this is a positive indicator that outperforms some Western societies, in which a large percentage of their people still resist taking vaccinations and consider them an end to personal freedoms [23]. Many people still have fears of taking the vaccine, but the data recorded globally about the safety and efficacy of vaccines against Covid-19 can encourage those hesitant to accept the vaccine, and these positive data will also serve to develop long-term plans at the level of national policies for countries. The current study confirms that a not-small percentage of the sample members (8.9%) were reluctant to take the vaccine, but the number is decreasing with the continuation of the vaccination campaigns. The study shows that the recurrence of infection after more than three months of receiving the vaccinations was mild symptoms and did not require intensive care or specialized cadres but rather was satisfied with the usual treatment program until a complete recovery was gained. We believe that those who showed some

mild symptoms were the result of being infected with some chronic diseases. The symptoms varied between mild and moderate in groups that rarely get the common cold, which reduce the efficiency of the immune system after receiving the vaccine. Therefore, the side effects of the vaccine were clearer for them and took a longer time to disappear.

There is another indicator shown by the current study, which is the commitment of about one-third of the vaccinated to the measures of prevention and continuous sterilization, and about half of the vaccinators follow these procedures to some extent. This is evidence of health awareness and the acceptable level of the research sample, the current problem is the rare nature of some of the vaccines' side effects, which requires international cooperation to assess the risks and overcome them. Patients with long covid may severs from chronic complications on multiple organ systems. Now there are millions persons in various countries are estimated to have long covid .Most studies focus to understand risk factors of long covid and best methods of treatment. During period from September 2022 to October 2023 bivalent mRNA COVID-19 vaccines recommended in U.S.A. Also the food and drugs administration approved updated (2023-2024) formula monovalent XXBB.1.5 for children aged more than 6 months to protect against associated outcomes of Covid. The other challenge is the provision of vaccines to the lower-income groups, which requires the development of vaccination programs in those communities [24-26]. But in Japan updated covid vaccine (fall 2023) reduced total numbers of covid related infections, risk complications and also cost in addition of effectiveness [27].

Conclusion:

The most age group that received the vaccine is (36-50) years, followed by (18-35) years, then more than 50 years and the most used vaccines are Pfizer, followed by AstraZeneca and Sinopharm. Ranking of Vaccines Effectiveness in terms of non-recurrence of infection, Pfizer was the first followed by AstraZeneca, then Sinopharm. In terms of the safety of the vaccines, there were mild side effects usual for most vaccinated and there were no symptoms a little of them after taking the two doses.

Source of Funding: Self

Ethical clearance: I undertake the accuracy of the information provided in the questionnaire and commit to maintaining the confidentiality of personal information the sample.

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