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Partial protection of Sinopharm vaccine against SARS COV2 during recent outbreak in Bahrain

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ABSTRACT

Background: In order to impart immunity against SARS COV 2 in the community, the oil rich countries of the Gulf Cooperation Council (GCC) provided citizens and expatriates with free vaccination. Different types of vaccination brands were utilized for this purpose. The purpose of this study is to determine the efficacy of the different types of vaccinations used.

Methods: This is an observational analytical case study of one Bahraini family who were vaccinated with 1st, 2nd or no dose.

Results: Out of 22 double dose recipients of SARS COV2 vaccine, 20 were infected. Those 20 were vaccinated against SARS COV 2 using Sinopharm, the rest (2) were in direct contact with the source but were vaccinated against SARS COV 2 using other type of vaccine. Out of 26 single dose recipients of Sinopharm vaccine, 23 were infected. The other three were not in direct contact with the infected source. Social gathering has been the main source of transmission. The infection has been mild with headache, chest pain. From 20 cases with double dose vaccinations only one had a lung infection and needed hospitalization. Out of 23 cases with single dose vaccinations 10 were hospitalized due to lung infections. All family members who were not vaccinated were infected, three were hospitalized one of which was deceased due to diabetes mellitus complications.

Conclusion: Sinopharm provides partial protection against SARS COV 2 infection. That might be due to lack of its potential to detect recent variations in the protein structure of spike(S) protein of virus.

1. Introduction

The current SARS COV 2 outbreak was highly contagious and widely spread. Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). Globally, as of July 4, 2021, there have been 182,319,261 confirmed cases of SARS CoV 2 including 3,95,32 deaths, reported to the World Health Organization (WHO, https://covid19.who.int/). Vaccination is the best way to fight SARS CoV 2 infection. To date, more than eight COVID-19 vaccines have been approved for vaccination among priority groups under an Emergency Use Authorization (EUA), including the Pfizer- BioNTech BNT162b2 vaccine [1], Sinopharm’s COVID-19 vaccines, Russia’s Sputnik V, AstraZeneca’s ChAdOx1 novel coronavirus 2019 (nCoV-19) [2], Moderna mRNA vaccine [3], and Janssen’s Ad26.COV2.S [4], Table 1.

Bahrain along with other Gulf Corporation Countries (GCC) have been pioneers in controlling the SARS COV 2 pandemic. This started with a compulsory two weeks lockdown in early March 2021, but life returned to normal soon afterwards. Later on, Bahrain participated in the third phase of Sinopharm clinical trials, and was faced with a sudden steep peak of COV 2. The Kingdom of Bahrain, is a GCC country. The island nation comprises a small archipelago made up of 70 natural islands and an additional 33 artificial islands, centered around Bahrain Island which makes up around 83% of the country’s landmass with a population of > two million. It is connected to Saudi Arabia via a 21 Km causeway. There is a great common socioeconomic as well as blood relationship between Bahraini and Saudi Arabia citizens. Both countries have pioneered in controlling COVID 19 with minimum lockdown and disturbance of social community. Along with other Gulf Corporation Countries (GCC), they have provided free vaccination to their populations, citizens and residents. In fact, in Saudi Arabia and Bahrain populations are given the choice of which vaccine to take. The choice included Pfizer-BioNtech, Sinopharm, Oxford-Astra Zenica and Sputnik V. In Saudi Arabia, Pfizer is the leading vaccine type, but due to

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2 day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average. The recent has reached a very sharp slope and reached to 2000 cases per day and deaths of 18 per day on average.

The threat of the COVID-19 pandemic, the emergence of SARS CoV-2 variants and by the end of June 2021 a total of 993896 (47% of total population) have been increasing in an exponential manner and reached 100s, and there has been a case for a non-smoker 59-year-old man who had breathing problems and was hospitalized. Another case, a 30-year-old lady who have had infection for the second time in less than a year. Interestingly, children aged 17 months and older also were infected with a very mild course of the disease. Out of eight unvaccinated members aged (60–86), all were infected, three of them were hospitalized, and one was deceased with diabetic complications.

### 4. Discussion and conclusion

Current SARS CoV-2 outbreaks have been very contagious which seems to be due to mutations in S protein of virus, E484K, which has been reported in different variants like the British, Brazilian and South African.

Therefore, vaccines under EUA may need to be updated periodically with respect to clinical efficacy against SARS CoV2 variants. Currently, many vaccines that have entered the clinical trial phase were developed based on the S protein, and the data indicate that the S protein is the most mutated part of the SARS CoV 2 virus. Increasing evidence also shows that some COVID-19 vaccines are less effective in protecting against variants [11]. These data suggest that vaccine manufacturers must update their vaccines in time to deal with viral mutations. Otherwise, the efficacy of the COVID-19 vaccine may be affected.

### 3. Results

Table 3 summarizes home quarantined, hospitalized and deceased cases (Table 3). Interestingly, majority of the infected family members were those who have had Sinopharm vaccine. There have been no reported complications especially among vaccinated old ages 65–85 years old. There has been a case for a non-smoker 59-year-old man who had breathing problems and was hospitalized. Another case, a 30-year-old lady who have had infection for the second time in less than a year. Interestingly, children aged 17 months and older also were infected with a very mild course of the disease. Out of eight unvaccinated members aged (60–86), all were infected, three of them were hospitalized, and one was deceased with diabetic complications.

### 2. Methodology

An extensive multiplexed Bahraini family, who received vaccination against SARS CoV 2, but still got infected was enrolled in this observational study (Table 2). The cases were recorded as diagnosed by Bahraini Ministry of Health affiliated centers for SARS CoV 2.

Written informed consents were collected from each participant family member.

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Current SARS CoV-2 outbreaks have been very contagious which seems to be due to mutations in S protein of virus, E484K, which has been reported in Britain, South Africa, Brazil and India [12–14]. Interestingly, two of individuals who had direct contacts with the source but were taken different type of vaccine did not show any symptoms. As a response, Bahrain started giving Pfizer booster to Sinopharm vaccine recipients. Our conclusion is that Sinopharm vaccine provides protection and reduces casualty but cannot prevent infection.

### Table 1

| Vaccine          | Vaccine Type   | Administered doses | Efficacy (%) |
|------------------|----------------|--------------------|--------------|
| Oxford/AstraZeneca | Adenovirus     | 2                  | 65.5         |
| Pfizer/BioNTech  | mRNA           | 2                  | 94           |
| J&J/Janssen      | Adenovirus Vector | 1                | 66           |
| Moderna          | mRNA           | 2                  | 94.1         |
| Novavax          | Protein plus Adjuvant | 2     | 89.3         |
| Sinopharm        | Inactivated Whole Virus | 2     | 79           |
| Sputnik V        | Adenovirus Vector | 2                 | 92           |

### Table 2

| Age Group/Years (Median Age) | VACCINATED | None (%) | 1st dose (%) | 2nd dose (%) |
|------------------------------|------------|----------|--------------|--------------|
| 18-86                        | 45.3       | 8 (14.3) | 26 (48.4)    | 22 (39.3)    |

### Table 3

| Vaccinated | Sinopharm | Infected (Type of Vaccine) | Home quarantined | Hospitalized | Deceased |
|------------|-----------|----------------------------|------------------|--------------|----------|
| Nil        | –         | 8 (Nil)                    | 5                | 3            | 1        |
| 1st dose   | 26        | 23 Sinopharm               | 13               | 10           | 0        |
| 2nd dose   | 20        | 20 Sinopharm               | 19               | 1            | 0        |
5. Concluding remarks

- use of inactivated native Wuhan SARS COV 2 viruses while others who have used molecular biotechnology might not be able to protect individuals from other strands of SARS COV 2 virus.
- Protective measure should be taken into consideration until the society reaches herd immunity.

In order to validate the above observational study, we would recommend to repeat such a study at a larger scale with a larger number of vaccinated patients by different brands. We also recommend quantifying the amounts of antibody produced by each and every vaccine. Owing to the availability of research facilities different strains of virus can be identified and the efficacy of vaccines determined. Further, some other variables i.e., no travel ban or restriction from infected countries, resuming local Cafés, false feeling of protection (pseudo protection) as a result of mass vaccination might have contributed to the latter outbreak of SARS COV 2.

Author statement

MJ contributed in research idea, methodology, data collection and writing up. MHS participated in methodology and editing.

Declaration of competing interest

This is to declare that authors have no Any financial interests or connections, direct or indirect, or other situations that might raise the question of bias in the work reported or the conclusions, implications or opinions stated.

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