RESEARCH ARTICLE

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Rare Side Effects after Inactiveted Sars-Cov-2 Vaccine (Coronavac)

ABSTRACT

Objective: To evaluate the frequency, type, onset time, and intensity of the side effects after the Coronavac vaccination in healthcare workers (HCW) and elderly people and also to determine whether COVID-19 disease occurs after vaccination in HCW.

Methods: HCW and elderly people who were vaccinated in Gaziantep Medical Park were the cohorts of the study. A questionnaire was applied to HCW, and the data of elderly people were obtained from medical records. The questionnaire had demographic data, medical history also included COVID-19-related and side effects of the Coronavac vaccine.

Results: Four hundred twenty-seven questionnaires were analyzed. The most common adverse reaction was pain at the injection site. The incidences of pain after the first and second injections were 23.8% (102/427) and 12.8% (52/405), respectively. And most common systemic side effect was fatigue with an incidence of 18.2% and 10.3% after each dose, respectively. Side effects that kept HCW from going to work after vaccination were not observed. After the two doses of vaccination, only 7 HCW had mild COVID-19 infection. One had a COVID-19 infection after 7 days of the first dose. 354 medical records of elderly people were evaluated. Only one of them reported urticaria after the first dose.

Conclusions: Our study found that Coronavac is a well-tolerated and effective vaccine.

Keywords: Adverse Reaction, Coronavac, COVID-19 Vaccination, Inactivated Vaccine, Efficacy, Healthcare Workers Vaccination, Safety, Side Effects.

İnaktive Sars-Cov-2 (Coronavac) Aşısı Sonrası Nadir Görülen Yan Etkiler

ÖZET

Amaç: Sağlık çalışanlarında (SÇ) ve yaşlılarda Coronavac aşısı sonrası görülen yan etkilerin sıklığını, türünü, başlangıç süresini ve yoğunluğunu değerlendirmek ve ayrıca sağlık çalışanlarında aşılama sonrası COVID-19 hastalığının gelişip gelişmediğini belirlemektir.

Gereç ve Yöntem: Çalışmanın kohortunu Gaziantep Medikal Park hastanesinde aşılanan sağlık çalışanları ve yaşlı hastalar oluşturmuştur. Sağlık çalışanlarına anket uygulandı ve yaşlı hastaların verileri tıbbi kayıtlardan elde edildi. Anket demografik veriler, COVID-19 dahil tıbbi geçmiş ve Coronavac aşısının yan etkilerini içermekteydi.

Bulgular: Dörtyüz yirmi yedi anket analiz edildi. En yaygın görülen yan etki enjeksiyon bölgesinde ağrı idi. Birinci ve ikinci enjeksiyonlardan sonra ağrı insidansı sırasıyla %23.8 (102/427) ve %12.8 (52/405) idi. En yaygın sistemik yan etki, her dozdan sonra sırasıyla %18.2 ve %10.3'lük bir insidansla, yorgunluktu. Aşılamadan sonra sağlık çalışanlarının işe gitmesine engel olabilecek yan etkiler gözlenmedi. İki doz aşılamadan sonra sadece 7 sağlık çalışanı hafif COVID-19 enfeksiyonu geçirdi. İlk dozdan 7 gün sonra bir kişi COVID-19 enfeksiyonu geçirdi. Yaşlılara ait 354 adet tıbbi kayıt incelendi. Bunlardan sadece bir tanesinde ilk dozdan sonra ürtiker bildirildiği tespit edildi.

Sonuç: Bizim çalışmamız, Coronavac aşısının iyi tolere edilen ve etkili bir aşı olduğunu tespit etmiştir.

Anahtar Kelimeler: İstenmeyen Olaylar, Coronavac, COVID-19 Aşısı, İnaktive Aşı, Etkinlik, Sağlık Çalışanlarının Aşılanması, Güvenlik, Yan Etkiler.

INTRODUCTION

There have been 176.693.988 confirmed cases of COVID-19 (Coronavirus disease 2019), including 3.830.304 deaths, reported to WHO (The World Health Organization) as of 17 June 2021, worldwide (1). The COVID-19 virus spreads primarily through droplets of saliva or discharge from infected people and affects different people in various ways. Clinical characters of COVID-19 range from asymptomatic to acute respiratory distress syndrome, multiple organ dysfunction, and death (2).

COVID-19 has not a specific treatment yet. The best way to control this COVID-19 pandemic is vaccination. Now, there are many types of vaccines (3). In Turkey, on January 13, 2021, the vaccination program started with Coronavac which is an inactivated SARS-CoV-2 vaccine developed by the Chinese biotechnology company Sinovac against coronavirus. Firstly Coronavac vaccine was applied to healthcare workers, disabled, and elderly people. On 01 June 2021, WHO gave emergency use permission to the CoronaVac vaccine (3).

To control this COVID-19 pandemic, we have to give efficient and harmless vaccines to people. Most people and some healthcare workers have questions about the safety and effectiveness of the COVID-19 vaccines, and they want to have more evidence about vaccines before vaccination. In the literature, there are few studies about COVID-19 vaccines' safety and efficacy. In this study, we want to analyze Coronavac side effects and effectiveness in real-life conditions.

MATERIAL AND METHODS

Study Design and Population: We applied a questionnaire to healthcare workers and staff who were volunteered to take a part in the study and worked in Gaziantep Medical Park Hospital in Turkey. Ethics committee approval was taken from the Ministry of Health of Turkey and Hatay Mustafa Kemal University ethics committee for this study.

We designed a self-administered questionnaire. The questionnaire contains basic demographic information, such as age, sex, occupation, health status, COVID-19 anamnesis, date of COVID-19 vaccination, and adverse reactions of Coronavac. The part of adverse reactions of the questionnaire includes local reactions as edema, redness, pain, itch, bruising, movement restriction, and systemic reactions as confusion, faint, fever, chills, fatigue, joint pain, muscle pain, skin rash, appetite, headache, dizziness, nausea, vomiting, abdominal pain, cough, shortness of breath, diarrhea, chest pain, palpitation, throat ache, somnolence, insomnia. We classified these adverse reactions as mild, moderate, and severe.

We obtained the data of elderly individuals who were applied the Coronavac vaccine in our hospital, from their medical records. The data include their age, co-morbidities, and side effects of the vaccine.

Descriptive statistics were used, and the results were expressed as mean (SD) and percentage.

RESULTS

We applied 450 questionnaires to HCW, but 427 questionnaires were appropriate to analyze. 405 HCW got two doses of vaccine. 22 HCW did not receive the second dose of the vaccine. 11 of them reported why they did not get the second dose. One had another health problem, three of them were waiting for the interval which was four weeks after the first dosage, three of them forgot to vaccinate, one had severe fatigue, so did not want the second dose, one thought that the vaccine was not effective.

Demographic and clinical characteristics of HCW are given in Table 1. 101 HCWs (23.65%) had COVID-19 infection before vaccination, 8 (1.87%) had COVID-19 infection after vaccination. Three HCWs became infected with COVID-19 after 40 days, two after 10 days, one after 50 days, and one after 63 days from the second dose of vaccine. One HCW had a COVID-19 infection seven days after the first dose of the vaccine.

Table 1. Demographic and clinical characteristics of healthcare workers

Characteristics (n=427)	findings
Age, mean (SD), y	30.47 (9.29)
Female, No. (%)	277 (64.87)
Co-morbidities	
diabetes mellitus	6 (1.40)
anemia	1 (0.23)
asthma	3 (0.70)
hypertension	5 (1.17)
chronic urticaria	1 (0.23)
multiple sclerosis	1 (0.23)
Fabry's disease	1 (0.23)
allergic rhinitis	3 (0.70)
hyperlipidemia	1 (0.23)
anxiety disorder	1 (0.23)
COVID-19 infection	
Before vaccination	101 (23.65)
After vaccination	8 (1.87)

Local and systemic side effects of the vaccine are given in Table 2. The most common side effect as a local reaction was mild pain with 12.1% after the first dose, and 6.7% after the second dose. There was mild fatigue in 8.0% after the first dose and 5.9% after the second dose of vaccine as a systemic reaction.

Table 2. Local and systemic side effects of vaccine

	After 1 vaccination (n=427)			After 2 vaccination (n=405)		
	Mild	moderate	severe	Mild	moderate	severe
Local reactions, No. (%)						
Edema	18 (4.2)	4 (0.9)	1 (0.2)	12 (3.0)	0 (0)	0 (0)
Redness	16 (3.7)	7 (1.6)	0 (0)	10 (2.5)	3 (0.7)	0 (0)
Pain	52 (12.1)	34 (8.0)	16 (3.7)	27 (6.7)	19 (4.7)	6 (1.5)
Itch	17 (4.0)	7 (1.6)	1 (0.2)	10 (2.5)	2 (0.5)	1 (0.2)
Bruising	10 (2.3)	5 (1.2)	0 (0)	7 (1.7)	1 (0.2)	0 (0)
Movement restriction	15 (3.5)	12 (2.8)	7 (1.6)	11 (2.7)	5 (1.2)	0 (0)
Systemic reactions, No. (%)						
Fatigue	34 (8.0)	26 (6.1)	18 (4.2)	24 (5.9)	12 (3.0)	6 (1.5)
Joint pain	17 (4.0)	27 (6.3)	11 (2.6)	15 (3.7)	8 (2.0)	3 (0.7)
Muscle pain	19 (4.4)	26 (6.1)	10 (2.4)	13 (3.2)	9 (2.2)	5 (1.2)
Skin rash	10 (2.3)	1 (0.2)	0 (0)	7 (1.7)	0 (0)	0 (0)
Appetite	6 (1.4)	7 (1.6)	4 (0.9)	7 (1.7)	1 (0.2)	0 (0)
Headache	20 (4.7)	15 (3.5)	18(4.2)	12 (3.0)	10 (2.5)	6 (1.5)
Dizziness	14(3.3)	9(2.1)	6 (1.4)	11 (2.7)	4 (0.1)	2 (0.5)
Nausea	11(2.6)	9(2.1)	4 (0.9)	7 (1.7)	2 (0.5)	0 (0)
Vomit	10 (2.3)	1(0.2)	2 (0.5)	7 (1.7)	1 (0.2)	0 (0)
Abdominal pain	9 (2.1)	3 (0.7)	1 (0.2)	7 (1.7)	0 (0)	0 (0)
Cough	9 (2.1)	2 (0.5)	2 (0.5)	6 (1.5)	2 (0.5)	2 (0.5)
Shortness of breath	9 (2.1)	1 (0.2)	2 (0.5)	6 (1.5)	1 (0.2)	0 (0)
Diarrhea	9 (2.1)	1 (0.2)	0 (0.0)	6 (1.5)	0 (0)	0 (0)
Chest pain	9 (2.1)	1 (0.2)	3 (0.7)	6(1.5)	2 (0.5)	2 (0.5)
Palpitation	11(2.6)	3 (0.7)	4 (0.9)	7 (1.7)	2 (0.5)	2 (0.5)
Throat ache	9 (2.1)	2 (0.5)	1 (0.2)	7 (1.7)	0 (0)	1 (0.2)
Somnolence	16 (3.7)	11 (2.6)	8 (1.8)	10 (2.5)	9 (22)	4 (0.1)
Insomnia	11(2.6)	3 (0.7)	2 (0.5)	7 (1.7)	1 (0.2)	0 (0)

As local reactions, there were mild, moderate, and severe pain in 12.1%, 8.0%, and 3.7% of patients, after the first vaccine and 6.7%, 4.7%, 1.5%, after the second vaccine, respectively. As systemic reactions, there were mild, moderate, and severe fatigue in 8%, 6.1%, and 4.2% of patients after the first vaccine and in 5.9%, 3%, 1.5% of patients after the second vaccine, respectively.

As systemic reactions, confusion, faint, fever, and chills were analyzed as 0.9%, 0%, 3.7%, and 1.6% after the first dose and as 0.5%, 0.5%, 2.0%, and 0.7% after the second dose of vaccination, respectively. There were no significant problems in their follow-up.

354 people older than 64 years who were vaccinated with Coronavac vaccine in our hospital, were included in this study. The mean (SD) age of these people was 71.3 (5.9) years, and most of them were women (n: 207 [58.5%]). There was hypertension in 119 patients (33.6%), diabetes mellitus in 88 (24.8%), cancer in 28 (7.9%), chronic obstructive pulmonary disease (COPD) in 7 (2%), heart disease in 9 (2.5%), asthma in 22 (6.21%), stroke, liver disease and rheumatoid arthritis in 2 (0.6%) parkinson's disease and epilepsy in 3 (0.84%), kidney disease in 5 (1.41%) as comorbidities.

DISCUSSION

Until today, no specific therapy for COVID-19 has been found. So an effective, side effect free, and easy to apply vaccine is the most necessary agent to control the COVID-19 pandemic. According to the WHO, as of June 18, 2021, 287 vaccine candidates were under clinical evaluation for COVID-19, and 102 candidate vaccines were in the clinical phase and 185 were in the preclinical phase (4). In Turkey, on January 13, 2021, the vaccination program started with Coronavac which is an inactivated SARS-CoV-2 vaccine developed by the Chinese biotechnology company Sinovac and got Emergency Use Authorization from the Turkish Medicines and Medical Devices Agency. CoronaVac (Sinovac Life Sciences, Beijing, China) is an inactivated virus vaccine which was one of the earliest to add the COVID-19 vaccine trials series in April 2020 (5). Based on its efficacy and safety results of phase I/2 trials, the vaccine was approved for emergency use in several countries (6).

In our country, the vaccination program has started as of January. However, many people and also doctors had questions about the efficacy and side effects of the vaccine (7). The only way to remove the question marks is to increase knowledge of real-life data and literature. We aimed to contribute to the literature by determining our own experience with this study.

Vaccination had started among healthcare workers in our country in February. We carried out this study at an average of 4 months after vaccination and only 8 people were infected in the hospital after vaccination. One of them was one week after the first vaccination. It was not clear whether this case was a pre-vaccine infection or a post-vaccine infection. These cases with COVID-19 infection after vaccination were followed up and treated in the Infectious Diseases and Clinical Microbiology department of our hospital. They had the disease with mild symptoms. Hospitalization of these patients was not required and COVID-related lung infection was not observed in any of the

patients. Compared to pre-vaccination, this number was very low. Meanwhile, we showed the efficacy. Inactivated SARS-CoV-2 vaccines had a low incidence of adverse reactions compared to other candidate vaccines and this was shown in many studies (8-10). Zhang M-X et al. showed in their study that the inactivated Coronavac vaccine has an acceptable safety profile among healthcare workers because of the low incidence of self-reported adverse reactions. And they documented that the most common adverse reaction was local pain at the injection site, with an incidence of 9.6% after the first dose and 10.7% after the second dose, accounting for 61.8% and 73.0% of adverse reactions, respectively (11). In a study from our country, it was demonstrated that the most common systemic side effect experienced after the Coronavac was fatigue, and the most common local side effect was pain (12). According to the evaluation report of the Food and Health Bureau (FHB) of Hong Kong SAR on Coronavac, the "very common" adverse reactions (≥10%) were injection site pain, headache, and fatigue (13). The results of our study are similar to all these studies. In our study, the most common adverse reaction was local pain in HCW. The systemic side effects that followed were fatigue and joint pain.

One of the significant aspects of our study is to show that Coronavac can be used safely over the age of 64. Urticarial plaques were found in the body of only one patient among those vaccinated over 64 years of age. The patient recovered with symptomatic treatment. No side effect was observed after the second dose of the vaccine. Real-life data was the advantage of our study. In addition, this study revealed very clear data about the effectiveness and safety of the vaccine, because HCW applied to the infectious disease's polyclinic of our hospital when COVID infection occurred instead of other clinics.

Our study has few limitations. One limitation is that it was single-centered. The other limitation is that we could not survey people aged 65 and over. So that, we could not investigate the minor side effects which elderly people do not need to report.

In conclusion, we demonstrated that Coronavac is an effective and well-tolerated vaccine also for elderly people.

Conflicts of interest: None.

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