BRIEF REPORT

COVID-19 among Indonesian ENT specialist and resident after second dose of Sinovac vaccination [version 1; peer review: awaiting peer review]

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Abstract

Background: The purpose of this study was to obtain data on the prevalence of specialist doctors and Otorhinolaryngology-Head and Neck Surgery (ORL-HNS) residents in Indonesia who suffered from Coronavirus disease 2019 (COVID-19) after receiving the second dose of COVID-19 vaccination using the Sinovac vaccine (CoronaVac) and the length of time infected with COVID-19 after the second Sinovac vaccination.

Methods: We performed a descriptive observational study, using a cross-sectional design. Data collection took place between August

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2021 and October 2021. The respondents in this study included specialist doctors and ORL-HNS residents who worked in various hospitals in Indonesia who had received the second dose of the Sinovac vaccination. Data collection was performed by means of Self-reporting Online Survey Platform (Google Form).
Results: This study included 1,530 respondents, and 54.2% of respondents were women. Respondents consisted of 68.6% ORL-HNS doctors and the rest were residents with an average age of 41.46 years old. The distance between the first and second doses of Sinovac was mostly under one month, which was 71.3% of the respondents. A total of 76.3% of respondents did not have co-morbid diseases. Based on this study, 16.9% of respondents suffered from COVID-19 after the second dose of Sinovac vaccination. The length of time suffering from COVID-19 after the second Sinovac vaccination was 3-6 months (9.7%).
Conclusions: Based on this study, 16.9% of respondents suffered from COVID-19 after receiving the second Sinovac vaccination and 9.7% suffered from COVID-19 after 3-6 months of Sinovac vaccination.

Keywords
Covid 19, Sinovac vaccine, Vaccination

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Introduction

Coronavirus disease 2019 (COVID-19) was first reported in Wuhan, Hubei Province, China, in December 2019. This disease is caused by the severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2).[1] The World Health Organization (WHO) declared the COVID-19 outbreak a global health emergency on January 30, 2020, and a global pandemic on March 11, 2020.[2,3]

Efforts to overcome COVID-19 were carried out, which included several strategies, one of which was vaccination. Vaccination is the most effective and efficient public health effort in preventing dangerous infectious diseases. Vaccines are a great hope as one of the primary weapons in controlling COVID-19.[4]

In the long run, COVID-19 vaccination aims to form herd immunity to protect all individuals and those unable to get vaccinated by reducing transmission of virus, and to lower morbidity and mortality for those affected (Ministry of Health Republic of Indonesia and National Guidelines on Vaccination Programme). This can only be achieved by high and even distribution of vaccination (WHO). Indonesia has carried out a national COVID-19 vaccination program since January 2021, which aims to create a condition of herd immunity (Ministry of Health Republic of Indonesia).

WHO has recommended types of vaccines that have been evaluated and are safe to use, including the Pfizer, Moderna, AstraZeneca, Jessen, Sinopharm, and Sinovac vaccines (WHO Vaccine Recommendation). The types of vaccines are divided into several categories, namely DNA vaccines, RNA vaccines, non-replicating viral vector vaccines, inactivated vaccines, live attenuated vaccines, and vaccine subunits.[4] Sinovac vaccine (CoronaVac) is one of the vaccines used in Indonesia according to the Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/ Menkes/4638/2021 (Decree of the Minister of Health of the Republic of Indonesia).

The Sinovac vaccine has received approval for use in emergency conditions from the Food and Drug Supervisory Agency (Decree of the Minister of Health of the Republic of Indonesia). Although vaccination can prevent transmission of COVID-19, and it is possible to become infected after vaccination. Furthermore, the effectiveness of the Sinovac vaccine also decreases over time (Decree of the Minister of Health of the Republic of Indonesia). Based on this, we conducted a study on the effectiveness of the Sinovac vaccine on Otorhinolaryngology-Head and Neck Surgery (ORL-HNS) doctors and residents as seen from the presence of infection after the second dose of vaccination.

Methods

Ethical approval

Due to the time sensitive and low risk nature of this project, we decided to carry out the research prior to getting ethical clearance as approval was taking longer than expected due to COVID-19 so we received retrospective approval for this study. Our original proposal included plans to start data collection in August 2021 following ethical approval and we planned to finish by the end of September 2021 and publish in October 2021, but due to the COVID-19 pandemic and part of our staff working remotely due to the Delta Variant of COVID-19, ethical clearance took longer to approve. Participant recruitment and distribution of questionnaires began on 1st September 2021, while data processing and finalizing the manuscript took place between February and March 2022. Ethical approval was granted by the Faculty of Medicine Universitas Indonesia in Dr. Cipto Mangunkusumo Hospital on 21st of February 2022 (approval number KET-188/ UN2F1/ETIK/PPM.00.02/2022).

Informed consent was acquired *via* written consent forms given to the participants as part of the questionnaire; the participant acknowledged that their data are to be used in a medical study.

Study design

We performed a descriptive observational study with a cross-sectional design conducted from September 2021 to March 2022. The inclusion criteria for this study were ORL-HNS doctors and residents who received the first and second Sinovac vaccinations and were willing to participate in this study.

Variables

Outcome variables in this research included respondent demographic characteristic, the interval between first and second vaccination, comorbidity, and time between infection and the second dose of vaccination.

Data sources/measurement

For this research, the data and measurement source were acquired directly from the respondent where they chose from list of choices given. The answers were then tabulated by frequency distribution (percentage).

Bias
Since we acquired data through questionnaires, recall bias from the respondent might occur. To deal with this issue the respondents were encouraged to cross check the information with their vaccine certificate and PCR results they have within the time frame.

Study size
With a finite population of 1,657, the total number of respondents was 1,593 people consisting of ORL-HNS doctors and residents in all provinces in Indonesia. Inclusion criteria were vaccinated with Sinovac on first and second vaccination. Exclusion criteria were those who had not received their first and/or second dose vaccination. Minimum samples needed for this study were 322 samples, we used total sampling and included 1,530 samples once inclusion and exclusion criteria were applied.

Quantitative variables
Quantitative variables in this study included age, time interval in vaccination time and time interval from second vaccination to infection.

Data collection
Data collection was performed using a questionnaire by The Self-reporting Online Survey Platform (Google Form). The translated questionnaire is available as *Extended data.*[5]

Data analysis
The collected data were analyzed using IBM SPSS Statistics (RRID:SCR_016479) version 25.0 and evaluated using descriptive statistical methods and displayed in terms of frequency and percentage.

Results
Table 1[6] shows the number of respondents who took part in this survey, which included 1,530 respondents consisting of 68.6% ORL-HNS specialist doctors and 31.4% ORL-HNS residents. A total of 54.2% of respondents were women with the average age of respondents being 41.46 years old. Table 2 shows the time interval for the first and second Sinovac vaccination, which at most was under one month (71.3%). Table 3 shows that the most common type of comorbid disease was hypertension (47.7%). Based on Table 4, it was found that 16.9% of respondents were infected with COVID-19 after the second dose of Sinovac vaccination, and 7.4% of respondents were infected before vaccination. Based on the data presented in Table 5, the period from vaccination to COVID-19 infection was 3-6 months (57.3%) for specialists and residents who were infected after the second vaccination dose.

Discussion
Based on this study, it was found that 258 (16.9%) of respondents suffered from COVID-19, after the second dose of vaccination. The length of time contracting COVID-19 after the second-highest dose of CoronaVac Sinovac vaccination was 3-6 months, as much as 9.7%.

Table 1. Demographic characteristics of respondents.

Variables	Frequency, n	Percentage, %
Sex		
Female	830	54.2
Male	700	45.8
Membership status		
Resident	480	31.4
Specialist	1050	68.6
Age, years		
Minimum	25	
Maximum	80	
Mean	41.46	
Standard Deviation	10.981	

Table 2. Interval time of first and second Sinovac vaccination time.

Sinovac vaccination time interval	Frequency, n	Percentage, %
Under 1 month	1,091	71.3
1-3 months	409	26.7
3-6 months	29	1.9
Over 6 months	1	0.1
Total	1,530	100.0

Table 3. Types of co-morbid diseases in respondents.

Types of co-morbid disease	Frequency, n	Percentage, %
Hypertension	173	47.7
Bronchial asthma	99	27.3
Diabetes mellitus	69	19.0
Cardiovascular disease	43	11.8
Autoimmune disease	18	5.0
Pregnancy	13	3.6
Blood Coagulation disorder	11	3.0
Liver disease	9	2.5
Kidney disease	8	2.2

Table 4. COVID-19 history. COVID-19, Coronavirus disease 2019.

COVID-19 history	Frequency, n	Percentage, %
Never been diagnosed with COVID-19*	1,149	75.1
COVID-19 before Sinovac vaccination	114	7.4
COVID-19 after the first Sinovac vaccination	9	0.6
COVID-19 after the second Sinovac vaccination	258	16.9
Total	1,530	100.0

*At the time of data collection.

Table 5. Time period from second vaccination to infection.

Time period from 2nd vaccination to infection	Frequency, n	Percentage, %
Under 1 month	10	3.9
1-3 months	66	25.6
3-6 months	148	57.3
Over 6 months	34	13.2
Total	258	100.0

The Sinovac vaccine produced by the Beijing-based pharmaceutical company Sinovac is a whole virus vaccine inactivated by adjuvant aluminum hydroxide (WHO). The efficacy of this vaccine based on phase 3 clinical trials conducted in Brazil was 51%, Turkey at 83.5%, and Indonesia at 65.3%. Furthermore, the efficacy of this vaccine remained the same in both groups with and without comorbidities, regardless of previous SARS-CoV-2 infection (WHO and Ministry of Health Republic of Indonesia). The effectiveness of Sinovac in preventing doctor visits and/or hospitalization was 74% (65–80%) in January to March 2021 in Indonesia, decreasing to 53% (33–67%). Meanwhile, the effectiveness in preventing death is 95% (53–99%) (National guidelines on vaccination programme).

Sinovac vaccine efficacy is indeed lower when compared to other types of vaccines, such as the Sinopharm vaccine showing 79% efficacy after two doses with an interval of 21 days (WHO, WHO interim, Ministry of Health Republic of Indonesia and Sinopharm Interim Recommendation); AstraZeneca vaccine has 72% efficacy after two standard doses with intervals varying from four weeks to 12 weeks (WHO interim); Moderna vaccine has 94% efficacy after receiving two doses (WHO interim), Pfizer vaccine has 95% efficacy after receiving the second dose with an interval of three weeks between the first and second doses of vaccine (WHO interim), the Sputnik V vaccine had an efficacy of 91.6% after receiving the second dose, and the Novavax vaccine had an efficacy of 89.7%.[7,8]

These results differ from a study conducted by Menni (2021), who found that the risk of being infected with COVID-19 after vaccination was more significant in individuals above the age of 55 years than those under 55 years old. This research also found that respondents with at least one comorbidity had a greater risk of being infected with COVID-19 after vaccination.[9] Based on a report by WHO, COVID-19 vaccination with the Sinovac vaccine has been proven in clinical trial participants with co-morbid obesity and hypertension (WHO).

Conclusions

Based on the present study, 16.9% of respondents suffered from COVID-19 after receiving the second Sinovac vaccination and 9.7% suffered from COVID-19 three to six months after the Sinovac vaccination.

Data availability

Underlying data

Figshare: MASTER DATA of Covid-19 among Indonesian ENT Specialist and Resident after Second Dose of Sinovac Vaccination.xlsx. https://doi.org/10.6084/m9.figshare.21173686.[6]

Extended data

Figshare: Questionnaire Covid-19 among Indonesian ENT Specialist and Resident after Second dose of Sinovac Vaccination. https://doi.org/10.6084/m9.figshare.21229742.[5]

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