Indian Journal of Forensic Medicine and Toxicology
Volume 16 No. 4, October-December 2022

The Severity Difference in COVID-19 Symptoms Between Vaccinated and Non-vaccinated People in al Basrah Province-Iraq

Muhannad Salah Hamza Alradhi[1], Yasameen Mohammed Abbas Alghadir[2]

[1]BS Pharm, MS in Pharmacy/Pharmaceutics, College of pharmacy, University of Basrah, Clinical Pharmacist, Iraqi Ministry of health, Basrah Health Directorate, Basrah-Iraq, [2]BS pharm, College of Pharmacy, University of Basrah, MS in Pharmacology, College of Medicine, University of Basrah, Basrah-Iraq.

How to cite this article: Muhannad Salah Hamza Alradhi, Yasameen Mohammed Abbas Alghadir. The Severity Difference in COVID-19 Symptoms Between Vaccinated and Non-vaccinated People in al Basrah Province-Iraq. Indian Journal of Forensic Medicine and Toxicology 2022;16(4).

Abstract

Introduction: The coronavirus pandemic has cross the continents creating millions of infected people and hundreds of thousands of dead, subsequently, a race against time to produce an effective vaccine was the humanity goal and hope. Many vaccines were developed with different production strategies, and with different protection margins, and despite the reported high efficacy of vaccines, a small percentage of people who received the food and drug administration (FDA) recommended vaccine doses still acquiring symptomatic or asymptomatic SARS-CoV-2 infection.

Objective: The main objective of this study was to compare the severity of COVID 19 symptoms in vaccinated and unvaccinated persons.

Methodology: Data of a total of 930 volunteers were collected and divided in to two main groups of Covid-19 infected people:1- vaccinated and 2-non-vaccinated patients each group were subdivided in to two other subgroups: a-healthy patients and b-patients with chronic diseases, performing the research in Al-Basra province. A 17-item questionnaire was established and was covered by a massage explain the research purpose and background. volunteers rate the severity of their symptoms in four degrees scale: intense, intermediate, mild and none for each there was a correspondent number helped to make the statistical analysis from zero to three.

Results: A total of 930 people took part in the survey. In 168 hours, from 6th of October to 22nd of October, 2021, we obtained 950 responses to the questionnaire. Overall, mean age of the responders was 32.8 years (SD ± 4.026), The total sample for validation study was 930 people receiving the questionnaire, (417 registered males and 533 registered females). Only 930 agreed to participate in this study (total response 97.8%), (71.8%) of the participants had a mild-to-moderate COVID-19 in the acute stage.

Conclusion: This study also shows that a large percentage of COVID-19 patients in Al Basrah province do not become infected after receiving the vaccine (74%), and that the symptoms of COVID vaccinated people are less severe than those of unvaccinated people.

Keywords: COVID-19, Symptoms, Vaccine, questionnaire.

Corresponding Author: Muhannad Salah Hamza Alradhi, Researchers,BS pharm, MS in pharmacy/pharmaceutics; college of pharmacy, University of Basrah, clinical pharmacist; Iraqi Ministry of health, Basrah Health Directorate, Basrah-Iraq.

E-mail: muhannad.alradhi@gmail.com

Introduction

For long time corona virus were believed to be a weak pathogen for human that cause a flu-like illness however with the outbreaks SARS, MERS in 2002 & 2012 subsequently, and nowadays SARS-CoV-2 their ferocity is very well confirmed globally[1,2].

Coronaviruses belongs to family Coronaviridae and the order Nidovirales and they are the hugest family of viruses[3,4] however our concern in sever acute respiratory syndrome- corona virus 2 (SARS-CoV-2) specifically which affect both lower and upper respiratory tract with wide range of symptoms starting with sore throat, common cold, fatigue, fever, dry cough, nasal congestion, and sometimes diarrhea reaching to severe pneumonia, difficulty in breathing and ends with death[5] beside the disrupted flavor and taste sensation earlier before respiratory involvement[6].

The coronavirus pandemic has cross the continents creating millions of infected people and hundreds of thousands of dead[7,8] subsequently, a race against time to produce an effective vaccine was the humanity goal and hope. Many vaccines were developed with different production strategies [9,10] and with different protection margins[11,12] and despite the reported high efficacy of vaccines, a small percentage of people who received the food and drug administration (FDA) recommended vaccine doses still acquiring symptomatic or asymptomatic SARS-CoV-2 infection[13,14] this called a vaccine breakthrough infection which defined as the detection of SARS-CoV-2 RNA or antigen in a respiratory specimen collected from fully vaccinated person after 14 days or more from the last dose of COVID-19 vaccine[15]. however the efficacy of COVID 19 vaccines in reducing the severity of symptoms to vaccinated infected people still a questionable especially by considering human genetic variation is geographically systematized[16].

Method

Data of a total of 930 volunteers were collected and divided in to two main groups of Covid-19 infected people: 1- vaccinated and 2-non-vaccinated patients each group were subdivided in to two other subgroups: a-healthy patients and b-patients with chronic diseases, performing the research in Al-Basra province. A 17-item questionnaire was established and was covered by a massage explain the research purpose and background. volunteers rate the severity of their symptoms in four degrees scale: intense, intermediate, mild and none for each there was a correspondent number helped to make the statistical analysis from zero to four. Other information was asked from each volunteer including age, sex, province, chronic diseases, type of vaccine and the method of COVID -19 infection diagnosis. All the responses were anonymous and the Inclusion criteria included age above 18 and belonging to Al- Basra city, any response below the age 18 and/or doesn't settled in Al-Basra were excluded. The registration period started from 6th of October to 22nd of October, 2021. after data collection were finished, data analysis by using t- test were done to calculate significance. A comparative measure between the symptoms of the four subdivisions were made beside calculations to the percentage of the infection after full vaccination, after single dose vaccination and for non-vaccinated respondents, the percentage of patients admitted to intensive care unit, the most common symptom all were performed.

Content of survey

The period of disease was assessed from its first COVID-19 diagnosis, with the assumption that at least two months should pass after healing to avoid terminology confusion. Patients' symptoms were classified into the following systems: general (fatigue, fever, and runny nose), respiratory (chest pain, dyspnea, and cough), cardiovascular (high blood pressure, angina, and MI), diabetic, dermatological (hair loss and rash), and GIT (abdominal pain, loss of smell and taste and vomiting, diarrhea). To assess the severity of the symptoms, participants were asked to rate each symptom on a scale of zero (no problem) to 4 (very severe)[17].

Statistical analysis

Percentages, frequencies, and mean SD were used when applicable. Statistical significance was defined as a p value less than 0.05. using Predictive Analytics Software version 19.0. The t-test was used to compare continuous variables for distributed data and categorical variables in parametric settings.

To identify independent variables of symptoms, multivariate logistic regression was performed.[18]

Results

During the study period, 950 people who had recovered from COVID-19 were asked if they wanted to take part in the study, and twenty of them refused to participate in the study. A total of 930 people took part in the survey. In 168 hours, from 6th of October to 22nd of October, 2021, we obtained 950 responses to the questionnaire. Overall, mean age of the responders was 32.8 years (SD ± 4.026) as seen in Table 1. The total sample for validation study was 930 people receiving the questionnaire, (417 registered males and 533 registered females) as shown in Table 2. Only 930 agreed to participate in this study (total response 97.8%), (71.8%) of the participants had a mild-to-moderate COVID-19 in the acute stage. The sociodemographic characteristics of the study population are presented in figure 1,2.

For registered people, the percent of healthy peoples (not have risk factor) are (82.3%). The percentage of patients suffering from respiratory disease, chronic heart disease, and diabetes are (6.1%), (9.8%), and (4.4%), respectively. The most common answers regarding the diagnosis of COVID 19 infection by PCR, CT scan, and others are (64.3%), (16.6%), and (19.1%), respectively. The percentage of people who have received the vaccine is 73.5%, while the percentage of people who have not received the vaccine is 26.5%. More than half of the registered people have received the Pfizer vaccine (68.6%) and about (15.7%) have received the Sino pharm vaccine while the others takes AstraZeneca (11.2%). (74.4%) of those in this study were vaccinated with two doses, while (18.7%) were vaccinated with a single dose. After receiving two doses of vaccine at different times, approximately (74%) of participants in this study did not become infected with COVID 19. Majority of registered people agreed to participate in this study and completed the questionnaire. Figures 1-4 illustrate the demographic and clinical characteristics of participants.

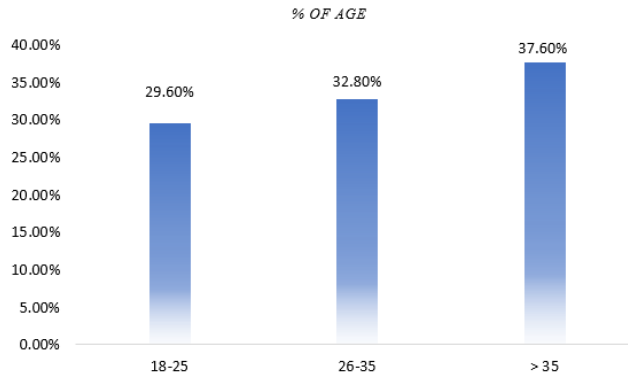

Figure 1: Age graphic of study

Figure 2: Gender graphic

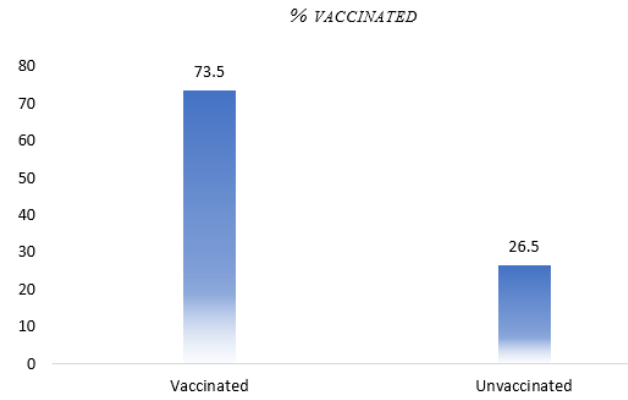

Figure 3: Percentage of vaccinated people in study

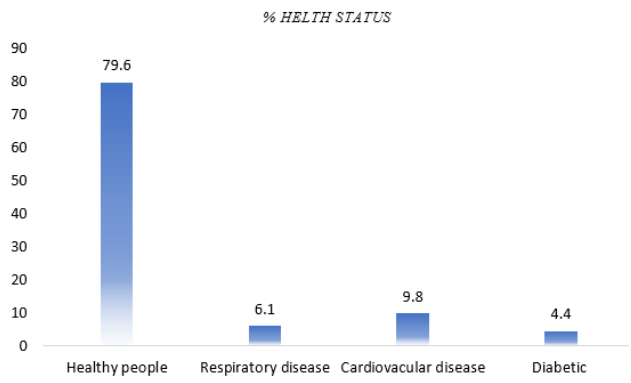

Figure 4: The percentage of participants in this survey who have a health and risk status (n = 930).

Moreover, our results clearly showed that, for vaccinated people, the infection period lasts (1-7) days (10.2%), while (5.3%) for period (8-14) days, and the registered people with infection period longer than 14 days are (10.5%) as in the figure 5.

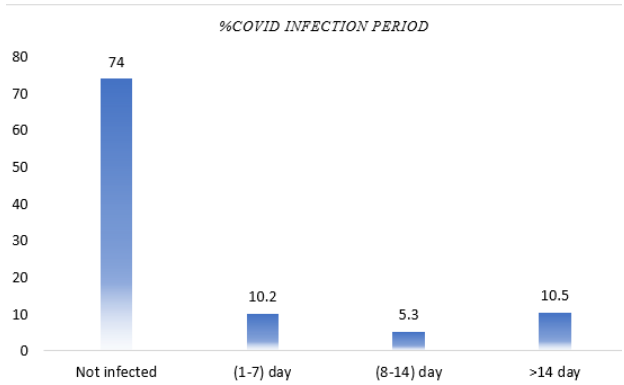

Figure 5: COVID 19 infection period

Health Status:

About (55.8%) of people registered in this study didn't become infected with COVID 19 after receiving the vaccine, while (5.2%) of those participating in this study became infected after receiving the first dose of vaccine, and (9.5%) became infected after receiving two doses of vaccine. (25.2%) of participants people in this study didn't receive vaccination yet, but they reported positive test. Only (8.5%) of people in this study who didn't take vaccination and do not infected.

Situation in the critical care unit:

The percentage of patients admitted to the intensive care unit (ICU) was (3.2%). While (95.7%) of those who participated in this study did not admitted to the intensive care unit.

Discussion

The information collected in the study will be important in raising public awareness about the consequences of the COVID-19 epidemic. In the current study, in which most data were collected via questionnaire, clearly demonstrated a difference in symptoms between vaccinated and unvaccinated people. The questionnaire contains various questions, the most important of which are (a) symptoms of COVID 19 patients before taking vaccine and (b) symptoms of COVID 19 patient after taking vaccine, in addition to types of vaccine taken, period of infection, vaccinated or not, and number of vaccine doses received[19].

Diabetes, respiratory disease, and chronic heart disease are the most significant risk factors, according to our research (Figure 6) Fever, loss of smell and taste, cough and sore throat, and shortness of breath were found as the top five strongest indicators of a COVID-19 infection (Figure 7) Nausea and vomiting have been recorded as a rare symptom.

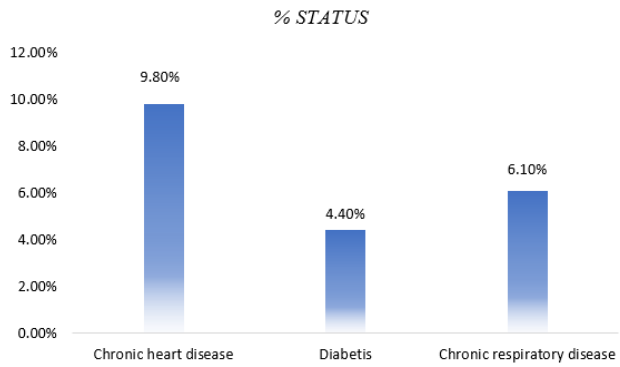

Figure 6: Risk factor

Demographical and clinical characteristics of participants ($n = 930$)

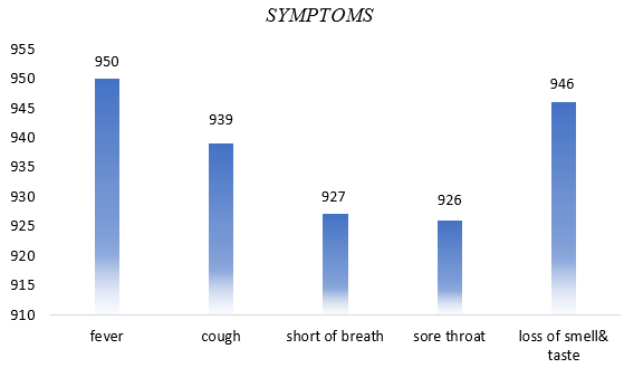

Figure 7: Strongest symptoms in peoples with positive test

Demographical and clinical characteristics of participants (n = 930)

Loss of smell and taste, according to Menni et al, should be part of routine COVID-19 testing. We fully agree with this viewpoint, as our data also suggests a high level of predictability. Although chills and fever are more common in COVID-19 patients, a loss of taste and smell in a clinical setting is unique and helps to distinguish COVID-19 from other infectious diseases, as many of them are followed by chills and fever. In the current situation, we believe that loss of taste and smell, especially when combined with the other symptoms, should be treated as a red flag, prompting immediate testing for COVID 19 and isolation of the patient until the virus is identified[20].

Vertigo, painful back, burning sensation of the tongue, thoracic pain, diarrhea, and runny nose were all found in the answers to the open question that asked for additional symptoms. Due to a lack of data and incomplete, a static analysis of these reported symptoms is not yet possible.

Furthermore, the data in this study also shows that only 20.3% of the participants had a chronic disease. Thus, people with these diseases can express them with the word (other) and persons don't have any history of disease express by (healthy person) when analyzing the data. In this study when comparing the data between healthy group (vaccinated and unvaccinated), reported a significant difference between vaccinated person (who receiving two doses vaccine) and unvaccinated through the severity of symptoms like fever P value = 0.021 and cough p value= 0.045, while insignificant difference between them in sore throat and loss of smell and taste p-value (0.687, 0.0812) respectively, while other symptoms like cough and fever are insignificant difference.

While in other group (people with chronic disease) reported a significant difference between vaccinated (who receiving two doses vaccine) and un vaccinated persons like sore throat and loss of smell and taste, the P values are 0.04 and 0.001, respectively. While insignificant difference in symptoms like fever and cough.

Although our collected data shows a significant difference between infected persons (healthy status) who receive two dose vaccines and another group of infected persons (healthy status) who receive one dose vaccine for symptoms such as fever, cough, loss of smell and taste, and sore throat, the P values are 0.012, 0.046, 0.0047, and 0.028, respectively.

In the other group of chronic disease individuals, this study found no statistically significant difference in all symptoms between those who received two doses of vaccination and those who received one dose of vaccine.

Our research has various advantages. First, as far as we know, this study, which examines the severity of COVID symptoms using a one-to-one questionnaire, has the most participants, with over 900 persons participating. Second, the study included a sufficient number of individuals from each risk group, including mild, moderate, and severe. Third, we looked into the vaccinated dosages. Fourth, we utilized a file to determine degrees of sensitivity to symptoms, use a scale of 0 to 4.

Limitations

This study has some limitations, the main limitation of our study is the timing of the survey in 6th of October to 22nd of October, 2021. The patient's self-declaration is the foundation of this investigation. There might be disparities in how patients perceive, express, and take their symptoms seriously. Another drawback of our study is the self-reporting nature of our data recovery methods. The design prevents confirmation of reported symptoms or test findings. Aside from that, participants are neither invited or

pre-selected, and they may not be representative of the broader population. The usage of a smartphone device may have resulted in a lack of representation among elderly persons. Another possible limitation is the number of participants that had been tested for SARS-CoV-2 infection. A possible correlation between age and gender was not considered in the univariate analysis of symptoms.

Conclusion

Our findings show that people should be more aware of COVID-19 and should get vaccinated. This study also shows that a large percentage of COVID-19 patients do not become infected after receiving the vaccine (74%), and that the symptoms of COVID vaccinated people are less severe than those of unvaccinated people. There is no doubt that there are gaps in people's knowledge of vaccines. As a result, people must be completely vaccinated in order to activate their immune systems and defend themselves against the epidemic[19].

Ethics: Approval of the study design was obtained by the Ethics Committee at the University of Basra /Medical college). The committee was very supportive of the project.

Source of funding: Self

Conflict of interest: Nil

References

1. Riski H, Hovi T. Coronavirus infections of man associated with diseases other than the common cold. Journal of medical virology. 1980;6(3):259-65.
2. Chan JF, Lau SK, To KK, Cheng VC, Woo PC, Yuen K-Y. Middle East respiratory syndrome coronavirus: another zoonotic betacoronavirus causing SARS-like disease. Clinical microbiology reviews. 2015;28(2):465-522.
3. Kahn JS, McIntosh K. History and recent advances in coronavirus discovery. The Pediatric infectious disease journal. 2005;24(11):S223-S7.
4. Fehr AR, Perlman S. Coronaviruses: an overview of their replication and pathogenesis. Coronaviruses. 2015:1-23.
5. Paules CI, Marston HD, Fauci AS. Coronavirus infections—more than just the common cold. Jama. 2020;323(8):707-8.
6. Melley LE, Bress E, Polan E. Hypogeusia as the initial presenting symptom of COVID-19. BMJ Case Reports CP. 2020;13(5):e236080.
7. Dong E, Du H, Gardner L. An interactive web-based dashboard to track COVID-19 in real time. The Lancet infectious diseases. 2020;20(5):533-4.
8. Hopkins J. COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE). Coronavirus Resource Center. 2020.
9. Pandey SC, Pande V, Sati D, Upreti S, Samant M. Vaccination strategies to combat novel corona virus SARS-CoV-2. Life sciences. 2020;256:117956.
10. Al-Kassmy J, Pedersen J, Kobinger G. Vaccine candidates against coronavirus infections. Where does COVID-19 stand? Viruses. 2020;12(8):861.
11. Mahase E. Covid-19: Pfizer and BioNTech submit vaccine for US authorisation. British Medical Journal Publishing Group; 2020.
12. Lurie N, Saville M, Hatchett R, Halton J. Developing Covid-19 vaccines at pandemic speed. New England Journal of Medicine. 2020;382(21):1969-73.
13. Swift MD, Breeher LE, Tande AJ, Tommaso CP, Hainy CM, Chu H, et al. Effectiveness of mRNA COVID-19 vaccines against SARS-CoV-2 infection in a cohort of healthcare personnel. Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America. 2021.
14. Haas EJ, Angulo FJ, McLaughlin JM, Anis E, Singer SR, Khan F, et al. Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data. The Lancet. 2021;397(10287):1819-29.
15. Paden CR, Tao Y, Queen K, Zhang J, Li Y, Uehara A, et. al. Rapid, sensitive, full-genome sequencing of severe acute respiratory syndrome coronavirus 2. Emerging infectious diseases. 2020;26(10):2401.
16. Jorde LB, Wooding SP. Genetic variation, classification and'race'. Nature genetics. 2004;36(11):S28-S33.
17. Kayaaslan B, Eser F, Kalem AK, Kaya G, Kaplan B, Kacar D, et. al. Post-COVID syndrome: A single-center questionnaire study on 1007 participants recovered from COVID-19. Journal of Medical Virology. 2021;93(12):6566-74.
18. Abdulameer SA. Knowledge and pharmaceutical care practice regarding inhaled therapy among registered and unregistered pharmacists: an urgent need for

a patient-oriented health care educational program in Iraq. International journal of chronic obstructive pulmonary disease. 2018;13:879.

19. Rossman H, Keshet A, Shilo S, Gavrieli A, Bauman T, Cohen O, et. al. A framework for identifying regional outbreak and spread of COVID-19 from one-minute population-wide surveys. Nature Medicine. 2020;26(5):634-8.
20. Menni C, Valdes AM, Freidin MB, Sudre CH, Nguyen LH, Drew DA, et. al. Real-time tracking of self-reported symptoms to predict potential COVID-19. Nature medicine. 2020;26(7):1037-40.