



Retrospective Cross-Sectional Analysis of COVID-19 Patients in a Local Hospital During Delta Surge

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Abstract

Many community members believe the vaccine is not effective against COVID-19 and that local hospitals are full of vaccinated patients with severe COVID-19. Furthermore, they feel national figures do not reflect local numbers. We aimed to analyze the profile of COVID-19 patients in our local community hospital in Sacramento, California to see if indeed most COVID-19 hospitalized patients are vaccinated. This is a retrospective cross-sectional study of COVID-19 patients that were admitted to a community hospital on August 26, 2021, during the delta variant surge. We analyzed the profile of patients in the hospital who had a positive COVID-19 test by PCR. A total of 96 COVID-19 patients were studied of which 20 are vaccinated and 76 are unvaccinated. The average age of hospitalized vaccinated patients with COVID-19 is 69 while unvaccinated patients is 52.6. Additionally, 24 patients were on high flow oxygen with only 3 of them being fully vaccinated. There are 26 patients in the ICU with COVID-19 of which only 3 are fully vaccinated. 21 of these ICU patients are on mechanical ventilation with only 2 being fully vaccinated. Our data is consistent with national trends. While breakthrough infections are inevitable, analysis shows that the elderly population is most significantly impacted. However, breakthrough infections tend to also be less severe. Importantly, the unvaccinated population with COVID-19 disease and hospitalization tend to be of younger age. Altogether, this data from our local hospital highlights and emphasizes the need for our community to be fully vaccinated to prevent COVID-19 disease and hospitalizations.

Keywords

COVID-19, SARS-CoV-2, Omicron, Delta Variant, Polymerase Chain Reaction

Introduction

Real-world observational studies and data from randomized clinical trials have shown that COVID-19 vaccines approved, Pfizer, and those under emergency use, Janssen and Moderna, are safe and highly effective in preventing COVID-19 illness, hospitalizations and death. The Centers for Disease Control and Prevention reports that unvaccinated individuals are 11 times more likely to suffer from COVID-19 than those fully

vaccinated [1].

Conspiracy theories, as well as vaccine misinformation, pose serious barriers against controlling the COVID-19 pandemic. Conspiracy theories often blame a certain group for involvement in manufacturing the virus or control the public opinion about it. For example, some groups believe the SARS-CoV-2 virus was deliberately manufactured by

the Chinese as a bioterrorist attack while others opinionated that COVID-19 was a hoax or exaggerated by left-wingers as a ploy to derail the U.S. presidential elections [2]. A study investigated the various conspiracy theories in different countries and found that of 578 rumors, 36% were related to vaccine development, availability, and access, 20% related to morbidity and mortality, 8% to safety, efficacy, and acceptance, and the rest were other categories [3]. Additionally, of these rumors and conspiracy theories, 5% were true, 83% were false, 10% were misleading, and 2% were exaggerated [3].

Furthermore, people who believe conspiracies report their intentions to vaccinate are 3.9 times lower and furthermore display less support for COVID-19 public health policies than participants who disbelieved conspiracies [4]. Increasing vaccination rates in our community is the best step towards ending the pandemic and tackling COVID-19 variants. To best increase vaccination rates, accurate local information from within the community should be presented. Therefore, in this retrospective cross-sectional study, we have analyzed 96 patients who presented with COVID-19 in Kaiser South Sacramento on August 26, 2021, highlighting the relevance and importance of vaccination status on COVID-19 illnesses and hospitalizations.

Methods

This is a retrospective cross-sectional study of COVID-19 patients that were admitted in Kaiser South Sacramento on August 26, 2021, specifically during

wave 4 of the COVID-19 pandemic and the delta variant surge. These patients were admitted in various parts of the hospital including the emergency department (ED), medical surgical floor, telemetry unit, and intensive care unit (ICU). In addition to patient age, we have included data on patient use of nasal cannula oxygen (up to 6 L/min), high flow oxygen (up to 60 L/min), continuous positive airway pressure therapy (CPAP / BiPAP), and ventilator/intubation. We do not report on any patient's ECMO use since this hospital is not equipped with ECMO. We have also reported the patients' vaccination status. A patient is considered fully vaccinated 2 weeks after the second dose of either Pfizer or Moderna vaccine, or 2 weeks after one dose of Janssen vaccine.

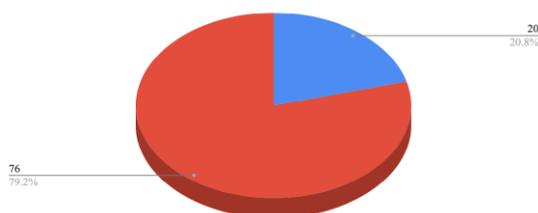
Results

96 patients (ages 14-94) suffering from COVID-19 were admitted in the Kaiser hospital in South Sacramento, California. 20 patients were fully vaccinated while 76 were not. The average age of hospitalized vaccinated and unvaccinated patients with COVID-19 is 69 and 52, respectively. Most of the admitted vaccinated patients were of ages >70. Of the 26 patients in the ICU, the average age of vaccinated patients is 65 while that of unvaccinated patients is 52.7. 13 of 23 unvaccinated ICU patients are under the age 50 (56%) while only 1 of 3 vaccinated patients in the ICU is under age 50 (33%). The need for a ventilator or high flow O₂ was greater in the age group of 30-70. Additionally, most of the patients in the age group 30-70 were unvaccinated (Fig-1 and Fig-2).

1A)

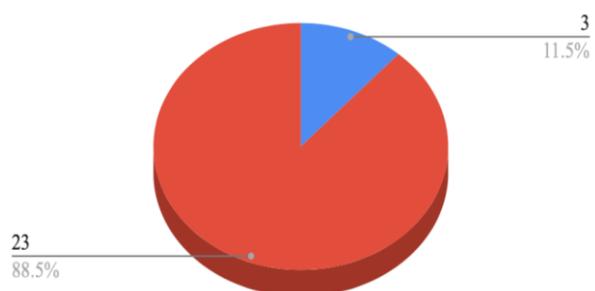


Total Hospitalized COVID-19 Patients (96)



1B)

Total COVID-19 Patients in ICU (26)



1C) Total COVID-19 Patients on High Flow O₂ (24) 1D) Total COVID-19 Patients on Ventilators (21)

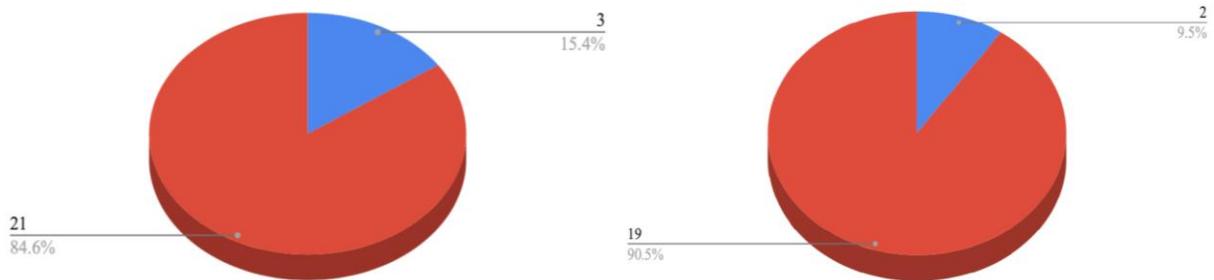


Fig-1:

Unvaccinated individuals make up the majority of the patient sample in any scenario. A. 79.2% of the admitted COVID-19 patients were unvaccinated. B. 88.5% of the patients in the ICU for COVID-19 were unvaccinated. C. 84.6% of the COVID-19 admitted patients requiring high flow oxygen were unvaccinated. D. 90.5% of the patients on ventilators were unvaccinated.

Of the 96 patients, 26 were in the ICU, of which 23 were unvaccinated. 21 patients were on mechanical ventilation, of which 19 were unvaccinated. 26 patients were on high flow oxygen of which 23 were unvaccinated. 88 patients were in the hospital because of COVID-19 related issues (91.7%). However, the other 8 were in the hospital for reasons unrelated to COVID-19 and of these 8 patients, 4 were unvaccinated.

Discussion

Our data from a local hospital greatly corresponds with national data and trends. Aligned with nationwide data, the majority of the patients hospitalized with COVID-19 in our study were of the older age group (>40). Additionally, a shift in response to COVID-19 disease based on vaccination status was more prominent in ages >70. From ages 14-69, most of the patients with COVID-19 were unvaccinated however

2A) Age Distribution of Hospitalized Vaccinated vs Unvaccinated COVID-19 Patients

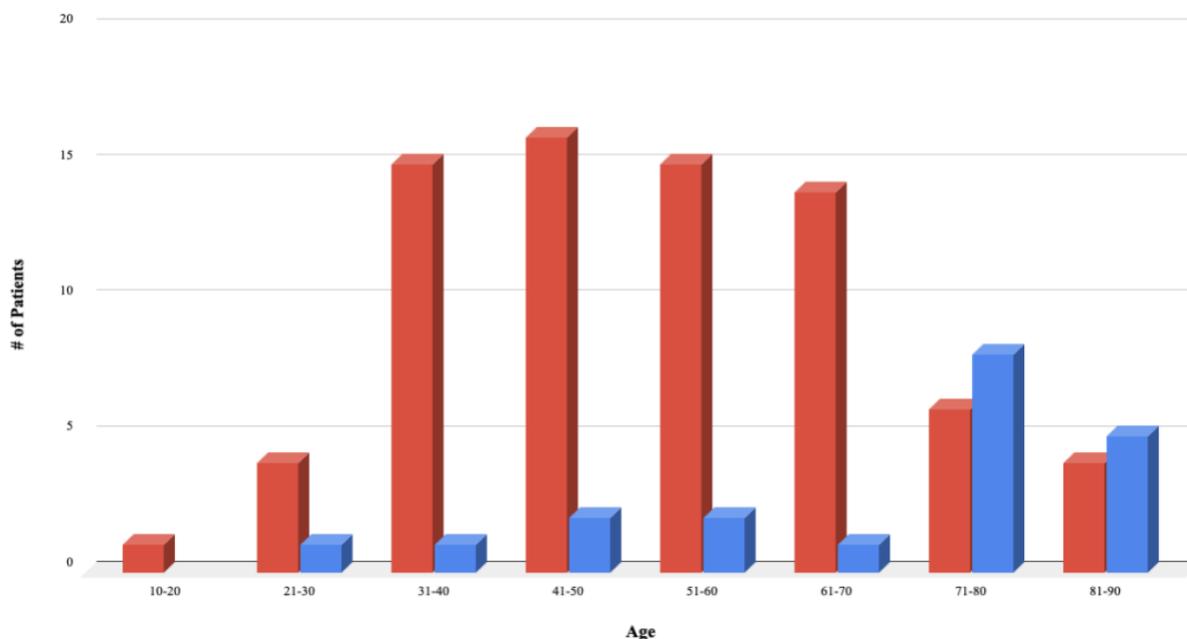


Fig-2A:

COVID-19 cases predominantly increased with age. From ages 10-70, most patients were unvaccinated however more patients >70 were vaccinated than unvaccinated.

2B)

Age Distribution of Hospitalized Vaccinated vs Unvaccinated COVID-19 Patients as well as Distribution of Those in ICU

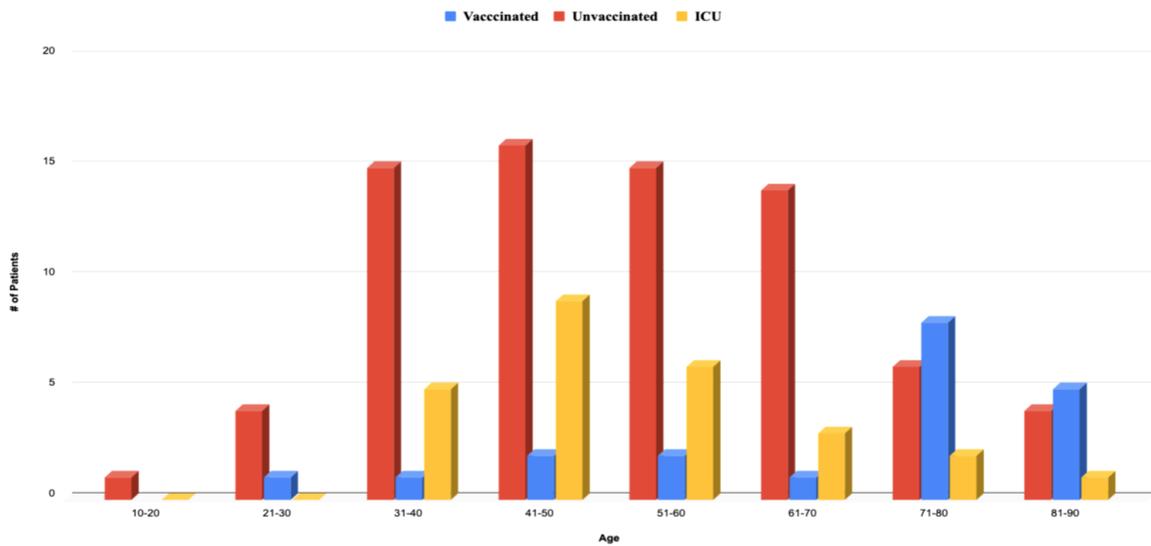


Fig-2B:

Majority of the unvaccinated admitted patients were in the ICU.

2C)

Age Distribution of Hospitalized Vaccinated vs Unvaccinated COVID-19 Patients as well as those on Ventilators

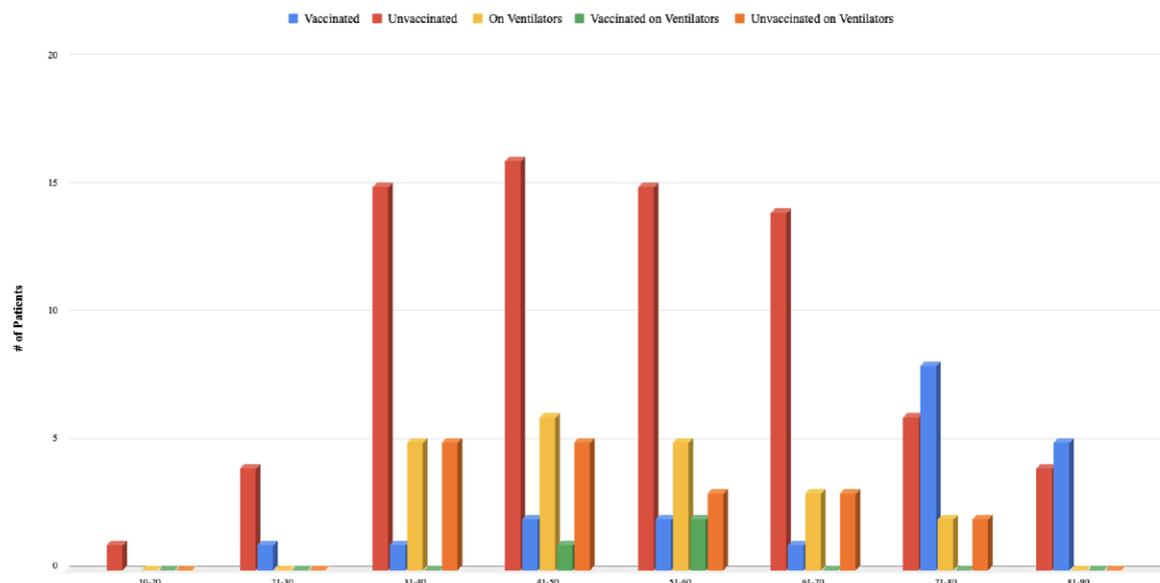


Fig-2C:

Most of the COVID-19 patients on ventilators were unvaccinated.

>70, the patient sample shifted towards primarily vaccinated patients. A breakthrough COVID-19 infection is one in which a fully vaccinated individual tests positive for COVID-19. Our data is consistent with the national trend, suggesting that those with vaccine breakthrough infections are from the older age group

while the unvaccinated patients tend to be younger. Furthermore, vaccine breakthrough infections also tend to have milder symptoms. 13 of 23 unvaccinated ICU patients were under the age 50 (56%) while only 1 of 3 vaccinated patients in the ICU was under age of 50 (33%). This further suggests Delta variant is making

more young folks sick than the traditional Alpha version.

A majority of the vaccinated sample in our study (15 of 20 or 75%) required only nasal cannula for oxygen support whereas a majority of the unvaccinated group (35 of 76 or 46%), nasal cannula was not sufficient for oxygen support. The unvaccinated group required ventilator use to a much greater extent (19 of 21 or 90%) compared to vaccinated individuals (2 of 21 or 10%). The need for ventilator and high flow O₂ was much greater in the 30-70 age group - which is primarily unvaccinated. Importantly, even though most of the COVID-19 patients >70 were vaccinated, they primarily did not require ventilator or high flow oxygen use. When directly comparing vaccination status and ventilator use, the ventilator use was increased in the age group 30-70 but within this age range, mostly unvaccinated individuals required ventilators. Specifically, in the age group of 30-70, 18 unvaccinated individuals required ventilators whereas only 1 vaccinated patient did. This trend is also seen in the age group of 30-70 with high flow oxygen and CPAP therapy use as well.

Lastly, a majority of these patients (88 of 96 or 91.7%) were admitted for COVID-19 as their primary concern. Of the few (8 of 96 or 8.3%) that were hospitalized for other reasons had an equal distribution of COVID-19 cases between vaccinated and unvaccinated groups.

Conclusion

Our data illustrates vaccinations are the best preventative measure in controlling the pandemic and reducing hospitalizations or severe disease against COVID-19. Furthermore, as SARS-CoV-2 variants

emerge, the need for increasing vaccinations is exemplified. Our future studies will aim to analyze the specific impact of various vaccine types as well as external factors such as BMI, diet, and reason for visit affect COVID-19 hospitalizations and disease.

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