CASE REPORT

COVID-19 VACCINATION TABOO: EARLY VACCINATION TO PREVENT SEVERE DISEASE IN THE ELDERLY A MYTH?

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Abstract

The Coronavirus disease 2019 (COVID-19) outbreak has become a global pandemic infecting millions of people globally, causing disabilities and significant loss of life, especially in the elderly population due to their greater susceptibility towards the debilitating infection leading to further complications. Thus, various vaccination program is underway to protect them against COVID-19. This case report of two elderly patients with comorbid who were infected with COVID-19 post-vaccination aims to showcase the importance of early vaccination to prevent severe disease and complications of COVID-19. Despite contracting the disease, both patients were asymptomatic and did not suffer any complications of COVID-19, providing evidence of the impact of early vaccination has on preventing complications in the elderly.

Keywords: COVID-19, vaccination, elderly population

Background

Coronavirus disease 2019(COVID-19) is a debilitating disease which has infected more than 180 million people around the world. As of June 2021, the death toll has amounted to 3,788,966 individuals. Many among the survivors were forced to retire early or suffered from reduced capacity and function in their daily activities or professional work due to long COVID complications. Various immunization programmes are being rolled out throughout the world by the respective nations to create herd immunity and reduce transmission. Even as these efforts to increase the vaccination are underway, many vaccination programs have received mixed reactions from the public due to misinformation regarding the vaccines. A study carried out in the U.S. showed that ~67% of respondents said they would accept a COVID-19 vaccine if it is recommended for them, with unemployed participants having lower acceptance compared to those employed or retired.[1] The concerns of the Malaysian public with regards to the COVID-19 vaccine share similarities to other nation, such as: incompatibility with religious beliefs, long term effects, side effects, potentially unknown future impacts on health as well as lack of trust in the manufacturing process, countries producing the vaccines, vaccine technology, the pharmaceutical industry, local government, and public health bodies. Other notable concerns include fertility, pregnancy, breastfeeding, experience with other vaccines (e.g. influenza) and belief in conspiracy theories (e.g. Covid-19 not being real, vaccines modifying DNA, etc.[2] This is a matter of concern with history having proven that vaccine hesitancy leading to a decline in vaccine uptake has resulted in increased prevalence of vaccine-preventable diseases.[3]

Malaysia has started its own immunisation programme since February 2021 with three types of vaccines, namely mRNA, inactivated virus, and viral vector vaccines. The COVID-19 National Immunisation Programme was rolled out in three phases across 500 vaccination centers in Malaysia in which phase 1 involves vaccinating high risk personnel comprised of frontliners including healthcare worker and personnel in defence and security systems. In phase 2, high risk group such as senior citizens more than 60 year old with chronic illness such as heart disease, obesity, chronic kidney disease etc are targeted whereas in phase 3, adults aged more than 18 years old will be vaccinated. The novel messenger RNA (mRNA) vaccine, Pfizer, reported the earliest Phase III result suggesting efficacies in excess of 90%.[4] This vaccine is widely used in Malaysia across all age groups and is planned to be used to vaccinate 50% of the population. While the other 50% of the population will receive inactivated virus and viral vector vaccine.[5] It is worth noting that the elderly with co-morbidities and frailty has been largely excluded in phase III studies and there are no published data on safety and efficacy in this group.[4]

As of the 12th of June 2021, the vaccine uptake in Malaysia stands at 4% of the population,[6] with the Malaysian government still taking active steps to encourage and increase vaccine uptake via multiple media platforms.

The objective of this case reports is to demonstrate the importance of early vaccination to prevent severe disease in the elderly.

Case Description

Case 1

An 84-year-old Chinese man with underlying ischemic heart disease was admitted into Hospital for positive COVID-19 nasopharyngeal swab PCR, following screening for being close contact with COVID-19 infected son. The patient was asymptomatic upon presentation to the hospital, however, considering the patient's premorbid and old age, he was admitted to hospital for close observation. Despite his age, the patient was independent and was able to perform basic daily activity without assistance. The patient was enrolled in the national Covid-19 Vaccination program and was fully vaccinated with an mRNA

vaccine, receiving his first dose on the 10th May 2021 with the second dose administered on the 31st May 2021. A COVID-19 PCR nasopharyngeal and oropharyngeal swab was taken, and the patient was confirmed to be COVID-19 positive on 2nd June 2021 (24 days after first dose of vaccination, 2 days after the second dose). Swab PCR SARS-CoV-2 RdRp cycle threshold value upon diagnosis was 16.30. The patient was well throughout admission.

Laboratory investigations showed normal full blood count results: white cell count of 5.4 $x10^9$/L; haemoglobin level of 13.5 X 10^{12}/L; with lymphocyte count of 22.6 percent. C reactive protein level was slightly elevated upon admission at 23.2 mg/L, with a repeated laboratory investigation showing C reactive protein level 5.2 mg/L at day 7 of illness. Beyond which, there was no evidence of any organ damage. A chest X-ray (figure 1) performed showed fairly clear lung fields. The patient's daily vital signs were stable and did not require any oxygen supplementation throughout the 11 days of hospital stay. Lungs auscultation was clear with no abnormality detected. The patient was discharged well without any complications on day 11 of illness.

Figure 1: Chest x-ray showed clear lung field. No consolidation or ground glass appearance seen.

Case 2

A 79-year-old patient with underlying ischemic heart disease and hypertension with previous history of admission due to gastric ulcer was diagnosed with Covid-19. Upon presentation to hospital, the patient was asymptomatic and was admitted for close observation due to the presence of multiple high risk factors and underwent a COVID-19 nasopharyngeal and oropharyngeal swab prior to an elective oesophagogastroduodenoscopy in hospital. He tested positive for COVID-19 on 13/6/2021 with SARS-CoV-2 RdRp cycle threshold of 31. The patient had been vaccinated with an mRNA vaccine as part of the mass vaccination programme rolled out in Malaysia, with 1st dose on 26/4/2021 and later second dose on 17/5/2021(Testing positive 27 days after the second dose of vaccination). The patient was well throughout hospitalisation and did not deteriorate further.

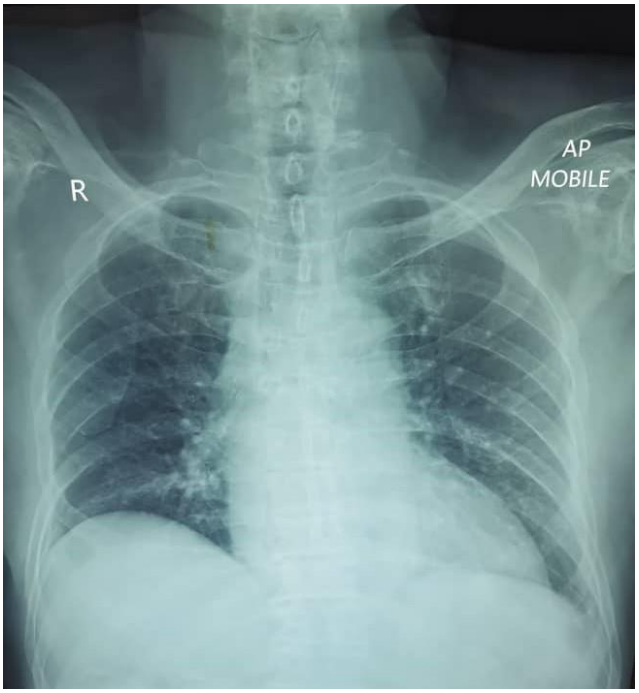

Figure 2: Chest X ray does not show any ground glass appearance or opacity

Laboratory investigations showed normal full blood count results: white cell count of 7.6 x10^9/L; haemoglobin level of 12.8 X 10^{12}/L; lymphocyte count of 21.6 percent; C-reactive protein level of 0.4 mg/L. A chest X-ray (figure 2) showed clear lung fields. The patient's daily vital signs were stable throughout the 11 days of hospital stay. Auscultation of lungs was normal. The patient did not develop any complications of Covid-19 and was discharged well.

Discussion

Both patients were able to maintain their premorbid function despite their old age after onset of Covid-19 infection. Both patients were able to ambulate independently and carry out basic activities of daily living such as toileting, grooming and bathing. In contrast, most elderly patients who survived and discharged from Covid-19 hospitalization have significant deterioration and limited functional ability that require assistance in basic activities of daily living. These disabilities caused increased prevalence of hospitalisation, increased health care burden and resources significantly and eventually lead to higher mortality rates.[7]

Cumulative results in studies on those receiving one dose of mRNA vaccines have shown its effectiveness in reducing events from 14 days after vaccination. It is more effective in reducing the severity of symptoms than preventing infection and can reduce emergency hospital admission by up to 50%.[8] COVID-19 patients commonly present with fever, cough, and shortness of breath. The elderly population, especially those with underlying medical problems like chronic bronchitis, emphysema, heart failure, or diabetes, are more likely to develop serious illness.[9] Some may even present with neurological symptoms manifested as acute stroke (6%), consciousness impairment (15%), and skeletal muscle injury (19%).[10] A notable case study had found an elderly patient to be encephalopathic, nonverbal, and unable to follow any commands with the onset acute infection.[11] In contrast, both elderly patients presented in this case study were found to be asymptomatic.

Cytokine storm is a common complication of COVID-19, which would cause acute impairment of respiratory function as well as increasing the risk of secondary and opportunistic infections, especially in elderly individuals and critically ill patients.[12] However, both patients had remained stable throughout hospitalisation and had not developed any signs of infection or acute respiratory failure as evident by their laboratory results that showed low CRP level, low white cell count level with normal lymphocyte percentage and did not require oxygen supplementation during their hospitalisations.

Chest X-rays of moderate to severe COVID 19 patients commonly demonstrate multifocal opacities and ground-glass opacities which is characteristic of COVID-19 infections.[11] With another case report showing an elderly patient with COVID-19 infection developing ARDS that required prolonged ventilation, complicated with organizing pneumonia and subsequently required long duration of oxygen supplementation and rehabilitation. [13] On the contrary, the chest x-rays of both patients in this study showed fairly clear lung fields. Better outcomes are rare in patients of a similar age group, where most will develop serious complications such as organizing pneumonia or pulmonary embolism which may lead to higher morbidity or long-term oxygen requirement.

This study is limited in its assessment of cardiovascular status and lung function after COVID- 19 infection due to limited access to equipment required to carry out those assessment in isolation. Another limitation in this study is that there are only small number of patients reported in this article. While there is clear indication that vaccination has a key role in reducing severity and complication of the disease especially in elderly patients, further study with larger sample sizes will be required to validate the findings of the case study and to produce statistically significant results.

Conclusion

It can be concluded that early vaccination has a key role in reducing COVID complications, in particular for elderly patients. Elderly patients (who tend to already be on medications) with better long-term outcomes after COVID-19 infection would not require as many medications to treat complications and therefore reduce the incidence of polypharmacy. This case study supports the evidence that vaccination is helpful to prevent severe disease and complications from COVID-19 in the elderly. Reinforcing the importance that COVID-19 vaccination continues with an emphasis on the elderly. Greater efforts may also be required in education to combat misinformation to ensure smooth and rapid vaccination of the elderly population.

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