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CASE REPORT

COVID-19 Vaccination Reduces Severity of SARS-CoV-2 Infection in Elderly – A Case Report

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ABSTRACT

Severe Acute Respiratory Syndrome Corona virus-2 (SARS-CoV-2) Pandemic affect whole world population. Elderly are more susceptible for infection due to fragile body and immune system. COVID-19 Vaccination is essential but there is fear in people regarding vaccination. This case report showed how COVID-19 vaccination decreases the severity of infection in elderly person.

Keywords: COVID -19 Vaccination; Case Report; Elderly; SARS-CoV-2

Introduction

Whole world is suffering from Severe Acute Respiratory Syndrome Corona virus-2 (SARS-CoV-2) pandemic. At present the goal is quick and widespread vaccination of the population. However, we know that no any vaccine will be 100% effective in stopping transmission or infection. Vaccine efficacy is dependent on relative risk reduction (RRR). Relative risk (RR) is the ratio of attack rates with vaccine and without vaccine (expressed as 1-RR) [1]. "Breakthrough infections" in some fully vaccinated people also reported these days [2]. People are considered "Partially vaccinated" after their 1st shot of vaccine and "fully vaccinated" 2 weeks after 2nd shot [3].

It is possible that a person can get SARS-CoV-2 infection in between the two doses or right before or after receiving the 2nd dose of vaccine before the body build up maximum immunity. [3]. Studies have shown that fully vaccinated people develop mild to moderate COVID-19 symptoms compared to those who aren't vaccinated. Fully vaccinated person has low risk of hospitalization and death due to COVID-19 in comparision to non vaccinated person [1].

Older adult population is rapidly growing population worldwide [4]. The United States Centres for Disease Control and Prevention (U.S. CDC) recommend for Covid-19 vaccination among people 65 and older [5]. Vaccines can help by preventing consequences of hospitalizations, loss of daily function and independence, impact on caregivers, lost productivity and exacerbation of poverty and inequalities [4]. They are at higher risk for contracting severe COVID-19 illness, develop complications, prolonged hospitalisation, and higher death rates. Older people are at high risk because of physiological changes such as more expression of Angiotensin Converting Enzyme 2 (ACE 2) receptors in old age leads to more chances of lower respiratory tract infections which require hospitalization and ventilator support [6]. Due to physiological changes their body become fragile and vulnerable to grasp any infection easily. With age there is change in the immune system, particularly affecting B cells, CD4+ T cells, and CD8+ T cells. Age and co morbidities also affect antibodies production [7,8].

Studies showed that there are less chances of hospitalisation of "fully vaccinated" and "partially vaccinated" adults aged 65 or more than 65 years old than non vaccinated people of the same age with COVID-19 [3].
This is a "case report" of "descriptive nature". Present case report is of a partially vaccinated elderly man who became ill/ develops COVID-19 symptoms on 3rd day after the 2nd dose of COVID-19 vaccination (Covishield).

Case Description

Chief complaints

A 78 years old male developed complaint of mild to moderate generalised body ache on 3rd day (28/03/2021 night) after receiving 2nd dose of COVID-19 vaccination; (Date of 1st dose and 2nd dose of vaccination was –15/03/2021 & 26/04/2021 respectively). From next day his body temperature rises with associated body ache. Fever was not associated with chills, rigour, sore throat, cough and cold. He had no complaint of loss of smell, loss of taste, shortness of breath, no any abdominal or urinary complaint. But his complaint persists and the temperature rises day by day. Fever reach up to 100.8°F (38.2°C) on 5th day (03/05/2021). He consult to his family physician by phone who advice him to do some blood tests. After seeing his blood reports and fever pattern family physician put him on 3rd generation cephalosporin - cifexime with ofloxacine, and Azithromycin. His fever reaches up to 102.4°F (39.1°C) on 8th day (06/05/2021) night. On 9th day (07/05/2021) his fever comes down and gradually touches to normal. But during this period patient develop complaint of intermittent bouts of cough. Cough was associated with sputum. Sputum was small in amount, thick in consistency, sticky, white in colour. His SpO2 varies between 88-92%. His fever again starts rising. For his complaint of cough and fever a combination of Amoxycillin (500mg) and clavulanic acid (125mg) twice a day (BD) and Methylprednisolone 4 mg BD was added. Steam inhalation - 5-6 times a day. He became afebrile and slowly his condition improves.

His post-vaccination period after 1st dose of COVID-19 vaccination was uneventful that is no any local or generalised symptoms developed. He remains alright for two days after receiving his 2nd dose of COVID-19 vaccine.

History of Past illness: Non-diabetic, known hypertensive since last 30 years and on regular treatment. No other chronic illness. Past history of one episode of Typhoid fever about 45 years back.

Personal history: Non smoker, teetotaller, no history of any drug abuse, pure vegetarian.

Family History: No other family member develop same illness.

Laboratory Examinations: His blood reports were – 6th day (04/05/2021) – Haemoglobin (Hb) was – 13.7gm%, Total leucocyte count (TLC) – 4100/Cu mm, Differential leucocyte count (DLC) – N65L30E03M02, Erythrocyte Sedimentation Rate(ESR) - Westergren method - 28 mm , Platelet count – 2.60 lakh/cumm Total R.B.C Count – 4.2 million/Cumm, PCV/Haematocrit Value – 39.3%, MCV - 93.57 fl, MCH - 32.62pg, MCHC – 34.86 g/dl, IgG antibodies to S.typhi O&H – Negative, IgM antibodies to S.typhi O & H – Positive 18th day (16/05/2021) - Haemoglobin (Hb) was – 13.4gm%, Total leucocyte count (TLC) – 11200/Cu mm, Differential leucocyte count (DLC) – N86L10E02M02, Erythrocyte Sedimentation Rate(ESR) - Westergren method - 26 mm , Platelet count – 3.69 lakh/cumm Total R.B.C Count – 5.1 million/Cumm, PCV/Haematocrit Value – 36.2%, MCV - 70.98 fl, MCH - 26.27pg, MCHC – 37.02 g/dl, IgG antibodies to S.typhi O&H – Negative, IgM antibodies to S.typhi O & H – Negative. Serum Sodium – 136.2meq/L, Serum Potassium – 3.1meq/L, Kidney Function Test – Blood Urea -39.2mg/dl, Serum Creatinine -1.78 mg/dl, Total Proteins -7.1 gm/dl, No Imaging examination and serological test to detect level of antibodies against COVID-19 was done.

Final Diagnosis: On 19th day (17th May 2021) - COVID-19 diagnosis was made by Real Time Reverse Transcription-polymerase chain reaction (RT-PCR) detection of nasal and nasopharyngeal specimen. Observed value was SARS CoV-2 (RdRp Gene) – 26.13, βCoV -2 (E Gene) - 24.64.

Treatment: Home isolation in a separate room from the 2nd day of development of bodyache. He remains on continuous 24x7 watch by family members. Continuous online consultation by doctors. 6 hourly temperature charting and SpO2 monitoring. Regular intake of water and nutritious food during his illness. For his complaint of fever and body ache paracetamol 650 mg, and supplements such as Zinc Once Daily (OD), Vitamin C–500 mg twice Daily (BD), Cholcalcirol sachet (60,00I.U. (Once in a week). A good antibiotic coverage given during whole illness in the form of - Cifexime 200mg + ofloxacin 200mg BD x 14 days, Tab. Azithromycin 500mg BD x 5days, combination of Amoxycillin 500 mg + clavulanic acid 125mg BD x 14days. During mid of disease Methylprednisolone 4mg BD given x 5days, 2mg BD x 3 days, stop. Ecosprin -75mg OD, Tab. Ivermectin 12 mg OD x 5days. Slight deficiency of potassium was covered by giving potassium rich fruits. Steam inhalation was given 4-5 times a day continuously.

Outcome And Follow-Up: Although detection of COVID - 19 infection delayed but after about 6 weeks he slowly recovered from the viral pneumonia. For his illness no antiviral medication, oxygen, high dose of steroid was given. Treatment was stopped except supplements (Vit – C, Vit-D once in a week), Ecosprin & medication for blood pressure. He is on regular respiratory (Lung) exercise by three balls Respiromer. After recovery initially he can able to lift only on ball but gradually he lift two balls out of three. Now he is practicing the deep breathing exercise, anulom-vilom, & breath holding exercises. He maintains his SpO2 – 96-98%. On 28/05/2021 his COVID-19 Virus Qualitative RT-PCR – Negative; on 09/06/2021 his C-Reactive Proteins (Quantitative) - 8.1mg/l.

Discussion

Covishield (COVID-19) vaccine (Oxford-AstraZeneca vaccine) was developed by Oxford University (Research name - AZD1222 (ChAdOx1) and manufactured by the AstraZeneca and by the Serum Institute of India locally. It was made from a weakened version of adenovirus which causes common cold in chimpanzees. This adenovirus has been modified to contain genetic material shared by corona virus spike protein (Non-Replicating Viral Vector). Its two doses are administered intramuscularly (0.5ml each). Sufficient antibodies are generated 10-15 days after the 2nd dose. Covishield has an efficacy (degree of protection that a vaccine offers against a disease after successful complete vaccination) of around 63.09% against SARS-CoV-2 infection (9).

In present case report on 6th day the DLC was N65L30E03M02 and on 18th day DLC was N86L10E02M02. In this the lymphocytes decrease from 30 to 10. According to previous clinical studies older people have lower levels of lymphocytes than younger people. In common viral infections lymphocytes are generally elevated; but in COVID-19 infection abnormally decreased [10]. This may

be possible that elderly got infection after receiving the 2nd dose of vaccine. Because his immune system was sensitizing to SARS-CoV-2 as he got 1st dose of COVID-19 vaccination (partially vaccinated) his immune system become activated and work against the infection [11]. He recovers without any antiviral medication and without any need of oxygen [12].

In present case report the explanation for his long duration of illness is that initially he thought that these sign and symptoms were side effect of 2nd dose of vaccine. Then he was treated as a case of Typhoid. The other explanation is that in old age there is variable response of immune system. Sometimes the ageing immune system does not respond by producing neutralizing antibodies against antigens as well as younger immune systems. In Some elderly participants no or minimal neutralising antibodies developed even after both doses of the vaccines [10]. Other explanation is that few viral variants escape from immune detection and flourish even in vaccinated people. Report said that an “RNA virus” such as SARS-CoV-2, mutate and give rise to variants. Some variants may be more easily transmitted such as B16172 variant [2]. Prolonged hospitalization, delayed viral clearance also depends on age [7].

Conclusion

Present case report showed that Vaccination against COVID-19 infection may reduce the severity of infection in elderly. So a complete vaccination is essential. Although going outside the home for vaccination exposes the elderly people and immune-compromised persons to COVID-19 infection. Therefore there is a need for home site vaccination of elderly and immune-compromised people.

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