



RETROSPECTIVE STUDY TO CORRELATE THE HRCT LUNG CHANGES IN RTPCR POSITIVE PATIENTS WITH VACCINATION STATUS

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KEYWORDS :

INTRODUCTION :

The first case of the notorious ongoing SARS-CoV-2 aka. COVID 19 pneumonitis was confirmed on 6th January, 2019.¹ Clinically, the patient can present with symptoms like fever, chills, cough, shortness of breath, difficulty in breathing, anosmia, body ache and few severe presentation like acute respiratory distress syndrome.² RTPCR is the gold standard laboratory investigation for confirmation of COVID 19 infection.³ Radiologically, typical pulmonary changes can be seen on HRCT chest study.⁴ Vaccination has led to a reduction in the transmission of the viral infection with decrease in the severity of infection in affected individuals. Two vaccines have been approved in India at the time of the study i.e. COVAXIN and COVISHIELD, both of which require two doses for complete vaccination. The aim of this study is to determine lung changes with respect to their vaccination status (partially vaccinated or completely vaccinated).

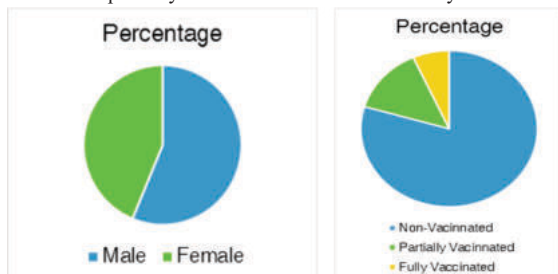
METHODS:

Retrospectively, data was collected between 1st June, 2021 and 18th August, 2021. HRCT chest of patients with RTPCR positive status (CORADS 6) and COVID suspects (CORADS 5) with RTPCR positive status confirmed on follow up were included in the study. Vaccination status with the type of vaccine (COVAXIN/COVISHIELD) received by these patients was determined - patients who had taken 1st dose of vaccination, 2nd dose of vaccination and who had not received any dose.

Patients above the age of 18 years who are eligible for vaccination in India were considered. HRCT chest CT severity score (1-25) was also documented.

RESULTS

- A total 240 patients with RTPCR positive status (CORADS 6) and COVID suspects (CORADS 5) with RTPCR positive status confirmed on follow up were included in the study. Out of these, 56.25 % were males and 43.75 % were females.
- Out of the total 240 patients, 79.58 % were non-vaccinated, 13.75 % were partially vaccinated and 6.67 % were fully vaccinated.

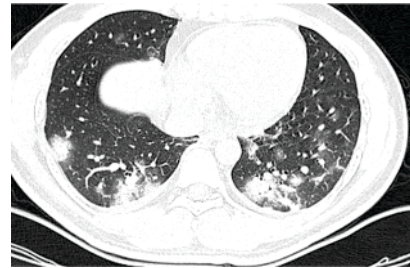


- The mean chest CT severity score in non vaccinated patients came out to be 12.199/25, in partially vaccinated patients is 10.575/25 and in fully vaccinated patients is 7.5/25.
- Mean CT severity score was lower for patients who had received both doses of vaccination than those who had received only the 1st dose of vaccine. Mean CT severity score in patients after 1st dose of vaccine came out to be 10.5/25 and after both doses was 7.5/25.

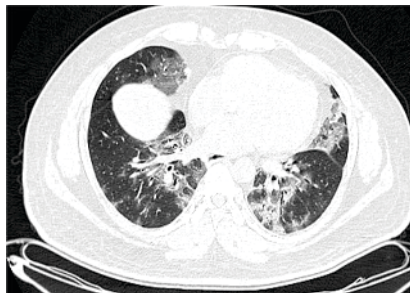
- HRCT changes were noted in 34 patients who had received the 1st dose of vaccine. Of these 6 patients had received COVAXIN and 28 had received COVISHIELD as their first dose.
- 16 patients showed changes on HRCT chest after being fully vaccinated i.e. after having received both doses of the same vaccine. Of these 5 had taken COVAXIN and 11 had taken COVISHIELD.
- Mean CT severity score after 1st and 2nd dose of COVAXIN was 10/25 and 11/25 respectively.
- Mean CT severity score after 1st and 2nd dose of COVISHIELD was 11/25 and 5.9/25 respectively.

CASES:

Case 1: 28-year-old male having already received the 1st dose of COVAXIN vaccine showed ground glass opacities on HRCT chest. CORADS 6, CTSS 12/25.

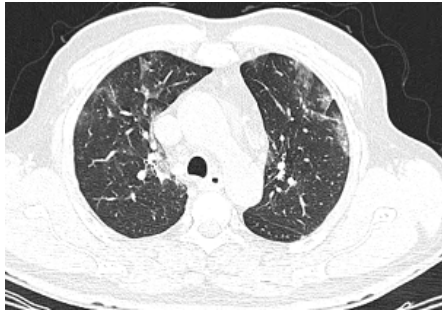


Case 2: 47-year-old male with ground glass opacities / opacification on HRCT chest, CORADS 6, CTSS 15/25. The patient had already received 2 doses of COVAXIN.



Case 3: 65-year-old female having already received the 1st dose of COVISHIELD vaccine showed ground glass opacities on HRCT chest. CORADS 6, CTSS 18/25.





Case 4: 73-year-old male having already received the 2nd dose of COVISHIELD vaccine showed ground glass opacities on HRCT chest. CORADS 6, CTSS 13/25.

DISCUSSION:

Pulmonary changes noted on HRCT include variable/ mixed presentation which include ground glass opacities, areas of consolidation, crazy pavement pattern, fibrous bands.

CT severity scoring by calculating the percentages of each of the five lobes that are involved: < 5% involvement, 5%-25% involvement, 26%-49% involvement, 50%-75% involvement, > 75% involvement. The total CT score is the sum of the individual lobar scores and can range from 0 (no involvement) to 25 (maximum involvement), when all the five lobes show more than 75% involvement.

- We observed that patients with complete and partial vaccination had lower average CT severity score which supports the effectiveness of the vaccines in preventing the severe disease to an extent.
- Significant difference in the mean CTSS was noted between that of non vaccinated and fully vaccinated patients. However, no significant difference/ correlation was noted between the mean CTSS of non vaccinated and partially vaccinated and partially vaccinated and fully vaccinated patients.
- The group which had received the first dose of COVISHIELD vaccine had a marginally lower average CTSS (10.6/25) as compared to the group which had received COVAXIN as the first dose (10/25).
- The average CTSS was significantly lower for the group which had received 2nd dose of COVISHIELD vaccination (5.9/25) in comparison to those who had 2nd dose of COVAXIN (11/25). Hence, showing that the 2nd dose of COVISHIELD is more effective than 2nd dose of COVAXIN.
- Also, taking two doses of COVISHIELD is more effective than two doses of COVAXIN.

CONCLUSION

Lower average CT severity score is seen in fully or partially vaccinated patients compared to unvaccinated patients and hence, complete vaccination in patients could be critical in preventing severe lung disease

LIMITATIONS:

It is a retrospective single center study. Only their basic demographics, COVID-19 RT-PCR status, vaccination status and CT severity score were available. Patient details such as their oxygen saturations, hospital admission status, co-morbidities were not available.

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