

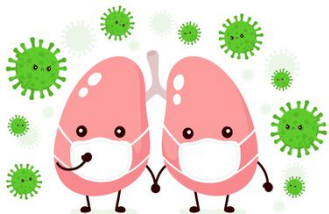


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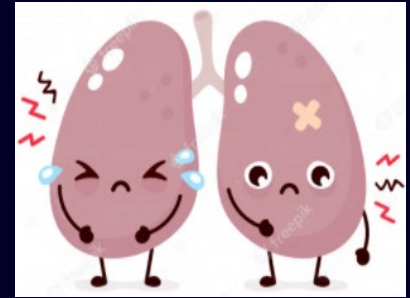
CLOSE MONITORING
OF BAROTRAUMA IN
CRITICALLY ILL
COVID-19 PATIENTS :
NEED OF THE HOUR

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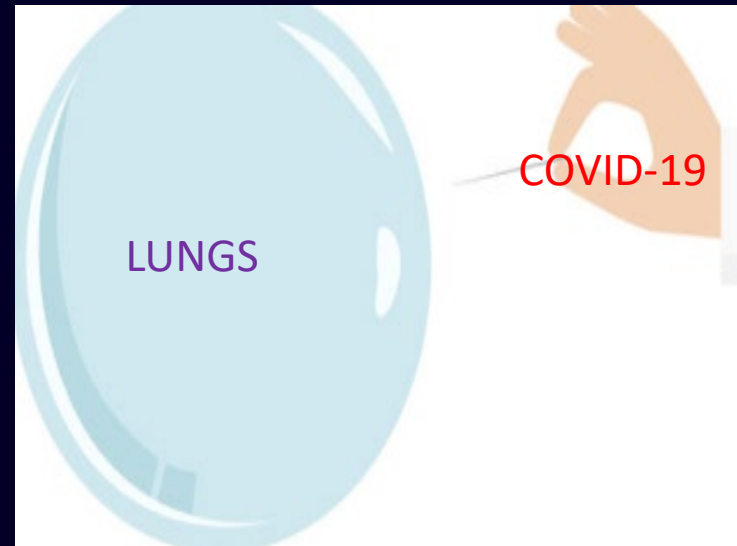


INTRODUCTION

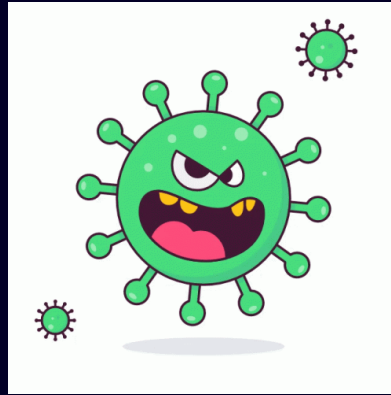


Management of critically ill COVID-19 positive patients has proven to be a major challenge for the medical fraternity due to several complications, one of which is barotrauma. Increased incidence of barotrauma (pneumothorax, pneumomediastinum and subcutaneous emphysema) has been noted in critically ill COVID -19 patients in several studies.

It has also been studied that the morbidity and mortality is higher in these patients and these patients can develop subsequent recurrent episodes of barotrauma.



COVID-19 INFECTION



**PARENCHYMAL CHANGES
LEADING TO INCREASED
FRAILITY OF LUNGS**

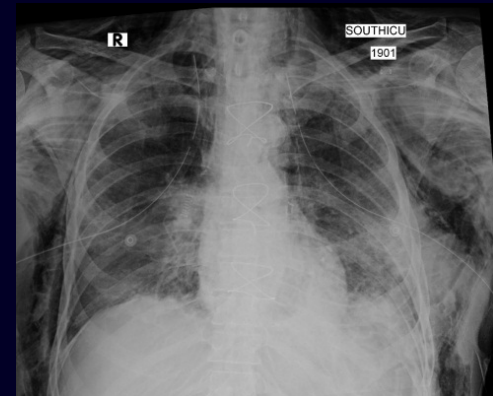
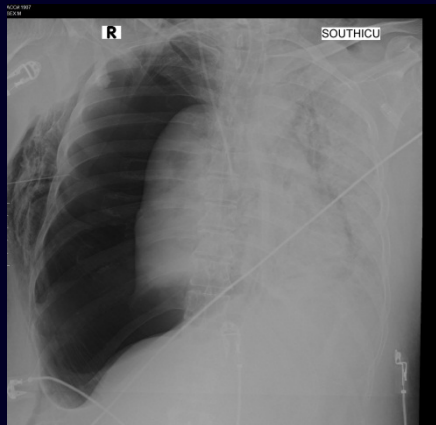
**INCREASED INTRATHORACIC
PRESSURE**

BAROTRAUMA

PNEUMOTHORAX

PNEUMOMEDIASTINUM

**SUBCUTANEOUS
EMPHYSEMA**



METHODOLOGY

- Critically ill COVID-19 patients were monitored through bedside radiographs obtained on 12-24 hourly basis (as per clinical and radiological discretion). Patients with subtle features of barotrauma were immediately identified and the information regarding the same was conveyed to the clinicians on an urgent basis. The clinicians and intensivists undertook measures to arrest/reverse the barotrauma and follow up radiograph was obtained for these patients at 12 hour interval, and subsequent radiographs at 24 hour interval, until resolution.

BAROTRAUMA FEATURES ON CHEST RADIOGRAPH

IN INTUBATED PATIENTS

- Optimisation of PEEP was done to the lowest possible value (maintaining a balance between the minimum PEEP required and preventing worsening of barotrauma).
- Increasing supplemental oxygen concentration

IN PATIENTS WITH SPONTANEOUS BAROTRAUMA

Increasing supplemental oxygen concentration

Repeat radiograph following the measures was taken at 12 hour interval and if decrease/no change was noted in barotrauma, subsequent radiographs were obtained at 24 hour intervals.



PATIENT POPULATION AND STUDY DURATION

82 critically ill COVID-19 positive patients admitted in COVID dedicated ICU were closely monitored over a period of 6 months from November 2020 to April 2021.

PARAMETERS ASSESSED-

1. NUMBER OF PATIENTS ADMITTED IN COVID DEDICATED ICU
2. PERCENTAGE OF COVID ICU PATIENTS INTUBATED
3. PERCENTAGE OF COVID ICU PATIENTS DEVELOPING BAROTRAUMA
4. NUMBER OF PATIENTS DEVELOPING VENTILATION ASSOCIATED BAROTRAUMA VS SPONTANEOUS BAROTRAUMA
5. RESOLUTION OF BAROTRAUMA COMPLICATIONS POST MEASURES

NUMBER OF ADMISSIONS IN COVID ICU

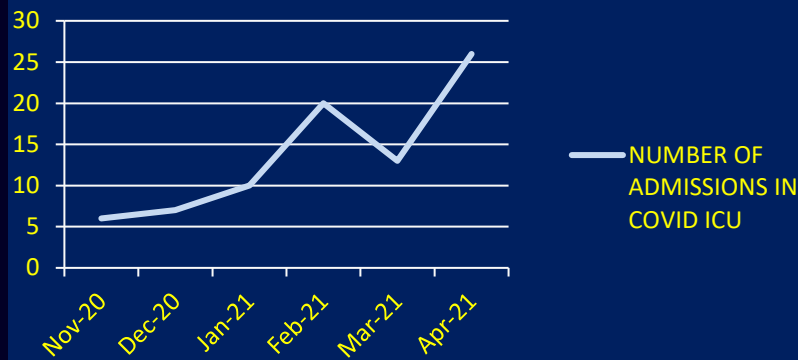


Fig1 shows the number of admissions in COVID ICU from November 2020 to April 2021

Increase in total of covid patients requiring ICU admission signifying increase in **total number** of cases and **disease severity**

PERCENTAGE OF COVID ICU PATIENTS INTUBATED

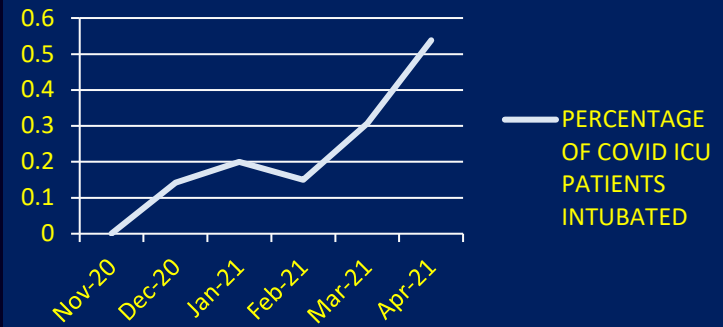


Fig2 shows the percentage of COVID ICU patients intubated from November 2020 to April 2021

Percentage of patients requiring intubation rose from mid-March and was about 53.8% in April. From this it could be interpreted that the disease **severity encountered in mid-March to April was high**. A possible explanation for this could be increased virulence and severe disease caused by double mutant strain (E484Q and L452R mutation) of COVID -19 virus which was discovered in the Indian population during the same time span.

PERCENTAGE OF COVID ICU PATIENTS (INTUBATED+NON INTUBATED) DEVELOPING BAROTRAUMA

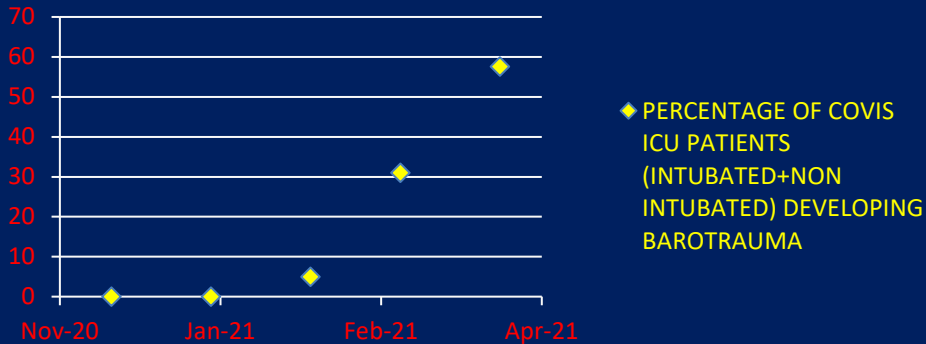


Fig3 shows the percentage of COVID ICU patients developing barotrauma from November 2020 to April 2021

Number and percentage of patients developing barotrauma also **rose** significantly from **mid-March to April**. The possibilities for this rise could be due to **increased number of intubations and/or because of the increased frailty of the lung parenchyma due to the mutant virus.**

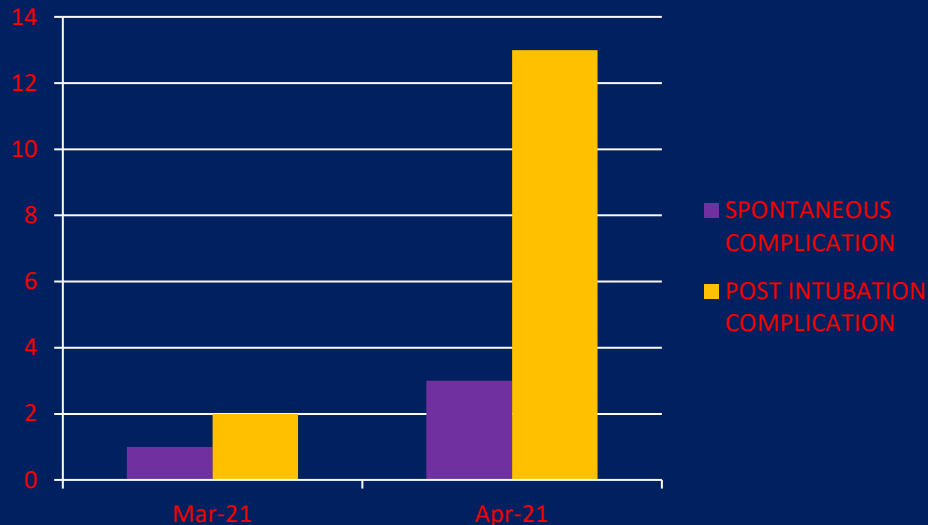


Fig4 depicts **spontaneous vs post intubation barotrauma** in COVID ICU patients showing **higher incidence of this complication in intubated patients.**

RESULTS

PERCENTAGE OF PATIENTS HAVING RESOLUTION OF BAROTRAUMA POST MEASURES

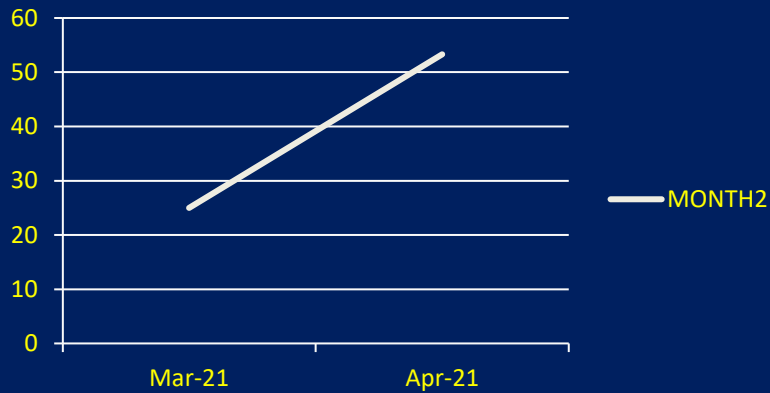
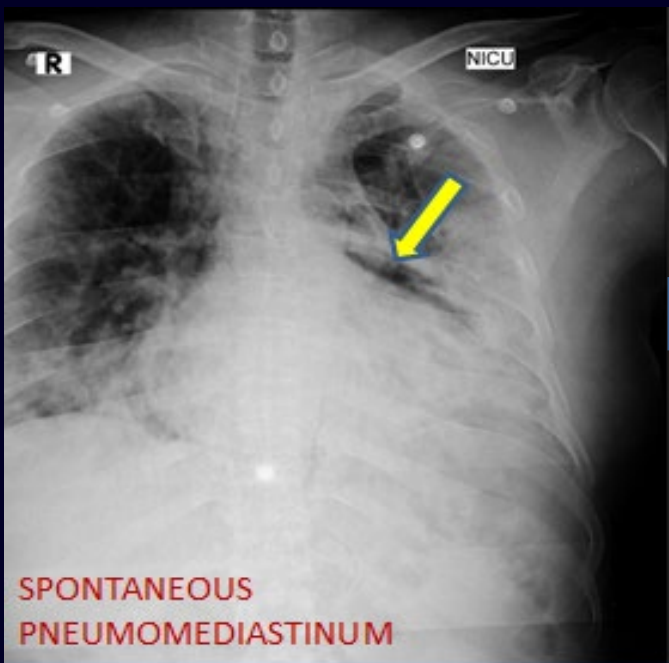


Fig5 shows the number of patients who experienced resolution of barotrauma post measures

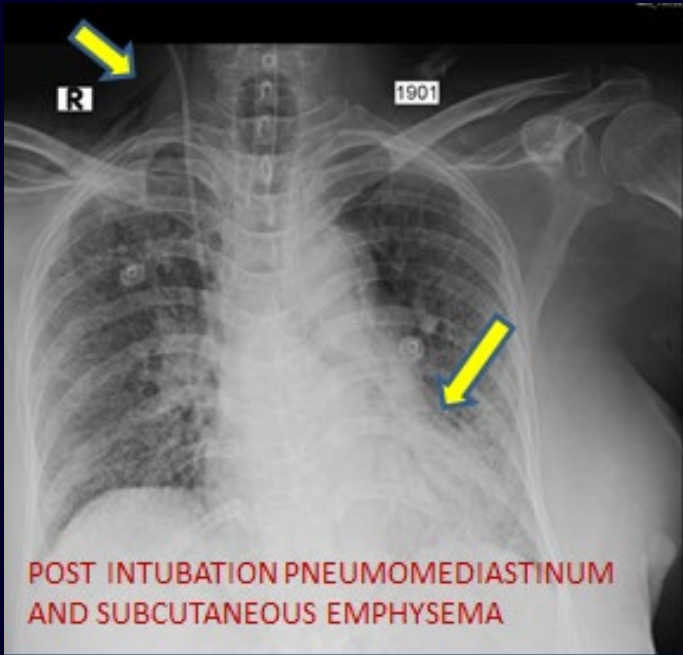
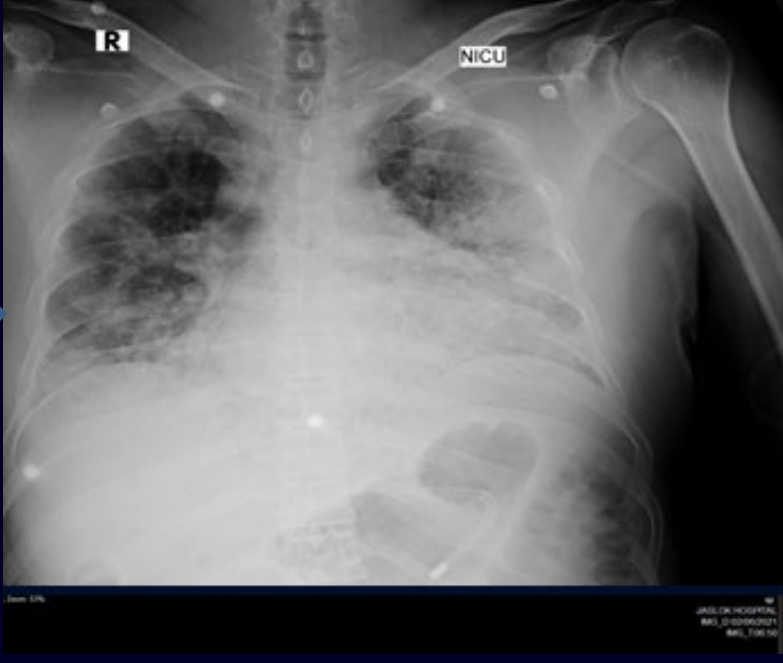
MONTH	PERCENTAGE OF PATIENTS SHOWING RESOLUTION OF BAROTRAUMA POST MEASURES
Mar-21	25(1/4)
Apr-21	53.33(8/15)

Table-1 shows the number and percentage of patients with resolution of barotrauma post undertaken measures

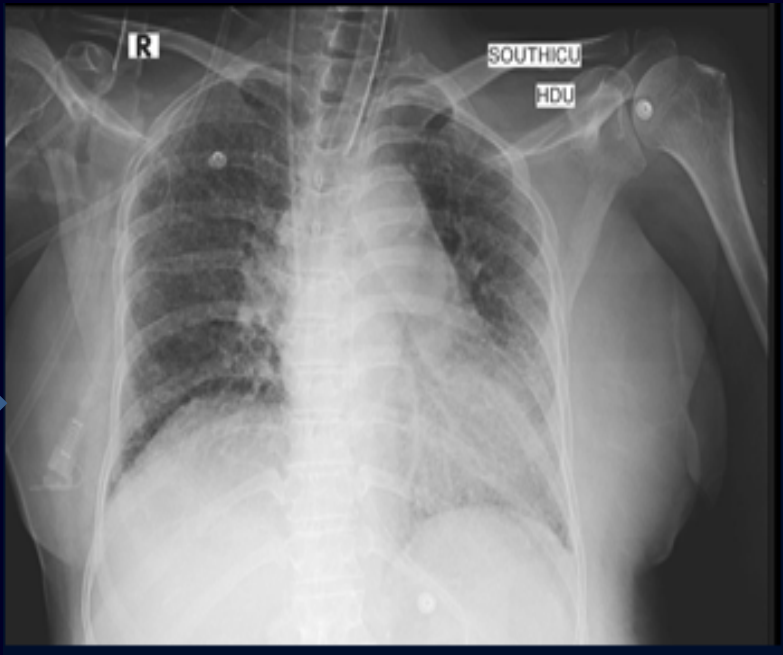
As depicted in the graph and table above a significant fraction of patients experienced reversal of barotrauma complications, hence close monitoring and stringent measures could help reduce morbidity of critically ill COVID-19 patients.



12hrs



24hrs



CONCLUSION

Studies done around the world have shown an **increased incidence of barotrauma** in COVID-19 patients but to our knowledge no study has closely monitored these patients with bedside **radiographs** for checking decrease/resolution of barotrauma after employing techniques to control them. Also as per our knowledge there has been no other study in India showing **sharp rise in barotrauma in COVID-19 patients coinciding with the emergence of the double mutant strain**.

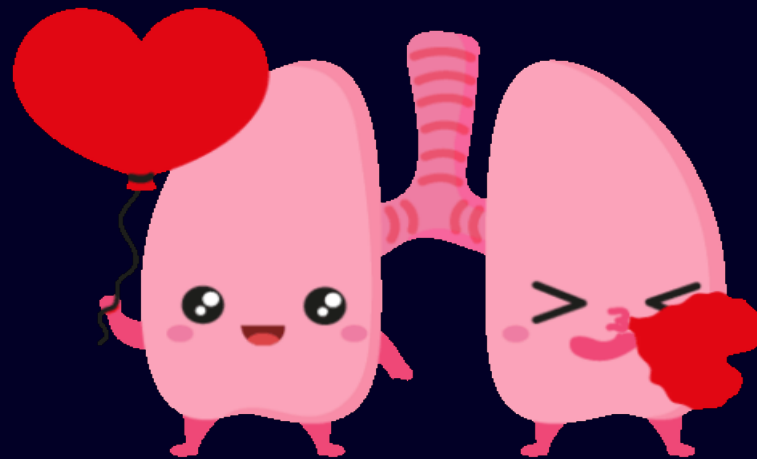
In our study we found that keeping a close watch for barotrauma and closely monitoring these patients with **serial radiographs and employing urgent measures** can significantly reverse these complications and can help in **reducing the morbidity and mortality**. Through this study we conclude that stringent monitoring is the need of the hour, with **radiologists** playing an important role in management of COVID-19 patients.





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THANK YOU