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Research Article

EPIDEMIOLOGICAL, CLINICAL AND LABORATORY PROFILE OF COVID PATIENTS DURING THIRD WAVE IN A TERTIARY CARE ICU SETUP IN NEW DELHI

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Abstract

Background: The world has seen multiple peaks and troughs due to various strains of SARS-CoV-2 virus since December 2019. We present the epidemiology, clinical and laboratory profile of critically ill patients infected with omicron strain during the third wave in a tertiary care ICU setup in New Delhi. **Methods:** This was a prospective observational study, including all positive patients admitted to a tertiary care COVID ICU from 20th December 2021 to 28th February 2022. All demographic, clinical and laboratory data of patients was recorded from their medical records without revealing their identity. The patients were then followed up to document the treatment received in ICU, eventual outcome and length of ICU stay. **Results:** A total of 112 patients were included in the study, out of which 54.5% of the patients succumbed to the infection. More than half the patients (56.3%) did not present with respiratory involvement, suggesting either a change in symptomatology from previous waves, or incidental COVID infections in otherwise ill patients. Upon further analysis, it was found that male sex, increasing age, higher Neutrophil-Lymphocyte Ratio (NLR) and C-Reactive Protein (CRP) on admission, lower PaO_2/FiO_2 Ratio (PF Ratio) and requirement of high-grade antibiotics had a positive correlation with patient mortality. ROC analysis revealed that optimal cut-offs for CRP, NLR and D-dimer for predicting mortality were 87.5 mg/l, 6.57 and 408.50 ng/ml, respectively. **Conclusion:** The above results indicate that omicron strain presents with more extra-pulmonary symptoms or incidental infections in already hospitalized patients than previous strains. Elderly males, severe pulmonary involvement, high NLR ratio and CRP on admission and requirement of higher antibiotics in ICU affect patient outcome.

Keywords: ARDS, COVID-19, CRP, Demographics, D-Dimer, Epidemiology, ICU, Mortality, NLR, SARS-CoV-2

INTRODUCTION

The world has been living under a constant threat of COVID-19 (Coronavirus Disease 2019) infection since December 2019, and in March 2020, a state of pandemic was declared by World Health Organization (WHO). The pandemic has shown regular troughs and peaks in infection rate due to mutations in the virus genome. The Center for Disease Control and Prevention (CDC) has categorized severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) variants as variants of interest, variants of concern and variants of high importance. [1]A new variant "B.1.1.529 or Omicron" was reported to WHO by South Africa on 24th November 2021 and on 26th November, it was pronounced as a "a variant of concern". On 29th November 2021, the organization proclaimed that omicron poses a "very high risk" globally, being a more transmissible variant. [2,3] Emerging SARS-CoV-2 variants, especially those "of concern", have an impact on the virus transmissibility and pathogenicity, as well as detection by conventional diagnostic equipment and vaccine effectiveness. Even though the SARS-CoV-2 Delta variant (B.1.617.2) emerged during India's second wave of infections, the omicron strain is the most divergent strain seen in significant numbers so far during the pandemic, raising concerns that it may be linked to greater transmissibility, lower vaccine efficiency, and an increased risk of reinfection. Omicron variant had a higher affinity for human angiotensin-converting enzyme 2 (ACE2) than the Delta variant due to a significant number of mutations in the SARS-CoV-2 receptor-binding domain (RBD), indicating a higher potential for transmission. [4] The third wave of COVID infection started in late December 2021 in India, particularly New Delhi. Our study aims to highlight the epidemiology and clinical picture of COVID positive patients admitted to the Intensive Care Unit (ICU) of a large tertiary care hospital of New Delhi.

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METHODS

Study design and sampling

This was a prospective observational study (ethical guidelines of the Declaration of Helsinki followed) conducted in the COVID-19 ICU of the authors' hospital in New Delhi, after approval from the institutional ethics committee (S.No. IEC/****/***/Project/2022-07/CC-22). Included were all patients over the age of 12 years admitted to COVID ICU between 20th December 2021 to 28th February 2022with an RT-PCR (real time Reverse Transcription-Polymerase Chain Reaction), Truenat™ or RAT (Rapid Antigen Test) positive report.

Data collection

A written informed consent was taken from the participants or their next of kin for inclusion of their data, without revealing patient identity at any point. Relevant demographic details like age and sex, comorbid conditions, symptoms and condition on admission, laboratory data like blood count, basic biochemistry and inflammatory markers were recorded. With the collected data, SOFA (Sequential Organ Failure Assessment) score, PaO_2/FiO_2 ratio(PF ratio) and severity of ARDS (Acute Respiratory Distress Syndrome) were calculated.

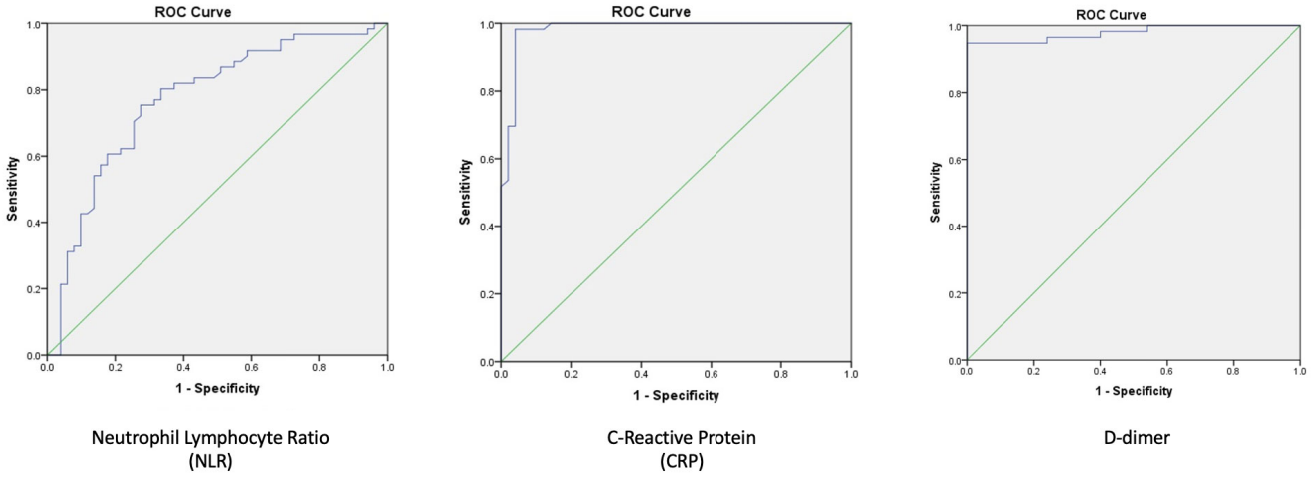

Figure 1. ROC analysis was used to identify optimal cut-off value of NLR, CRP and D-dimer, respectively, on admission to differentiate survivors from non-survivors. An NLR value of 6.57 on admission was identified as optimal cut-off to predict mortality (Area under ROC, AUROC = 0.771, standard error 0.046, 95% CI 0.682-0.861, p <0.001). For CRP, a cut-off value of 87.5 mg/L was found acceptable to predict mortality with a sensitivity of 0.982 and specificity of 0.878 (AUROC = 0.983, standard error 0.012, 95% CI 0.959-1.000, p <0.001). D-dimer ROC revealed a cut-off value of 408.50 ng/ml for differentiation of survivors and non-survivors with a sensitivity of 0.947 and specificity of 0.84 in predicting mortality (AUROC = 0.979, standard error 0.013, 95% CI 0.954-1.000, p <0.001)

Severity of ARDS was defined based on PF ratio, as per the Berlin definition. [5] SOFA scores at admission were also calculated using the involved variables – GCS (Glasgow Come Scale), Systolic Blood Pressure (SBP), PF ratio, platelet count, serum creatinine and bilirubin. Upon admission to ICU, standard care like ulcer-prophylaxis, thromboprophylaxis, nutrition, blood sugar control and positioning was instituted for all patients. The course of ICU stay of patients was followed prospectively, and major therapeutic drugs given like antibiotics (low grade antibiotic cover - amoxicillin-clavulanate, azithromycin, doxycycline,and high-grade antibiotic cover - piperacillin-tazobactam, cefoperazone-sulbactam, meropenem, teicoplanin, polymyxins), anticoagulants, steroids and remdesivir were noted. Finally, patient outcome (transfer to ward or expiry)was recorded along with length of ICU stay (LoS). All data was tabulated in a master chart and relevant statistical analysis performed.

Statistical analysis

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean ± SD and median. Normality of data was tested by Kolmogorov-Smirnov test and Shapiro-Wilk test. If the normality was rejected, then non-parametric test was used.

The following statistical tests were applied:

1. Quantitative variables were compared using Unpaired t-test/Mann-Whitney Test (when the data sets were not normally distributed) between the two groups. Analysis of variance (ANOVA) was used to check if the means of two or more groups are significantly different from each other. To investigate more into the differences between all groups, Tukey's Test is performed.
2. Qualitative variables were compared using Chi-Square test /Fisher's exact test.

A p value of <0.05 was considered statistically significant. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 23.0.

Data analysis

Existing literature on epidemiology of patients infected with omicron variant was searched and the demographics, clinical characteristics, laboratory parameters and outcome were compared with our study population.

RESULTS

After application of inclusion and exclusion criteria, electronic medical records of112 patients were included in the study. Demographic characteristics of the study population are outlined in table 1. Out of 112 patients, 61.6% were males and 38.4% were females. Mean age of the population was found to be 50.94 ± 20.10 years. Age-wise distribution has been detailed in table 1. More than half the patients (56.3%) did not have any respiratory symptoms on presentation. They either presented with non-SARI (Severe Acute Respiratory Infection) features of COVID or had incidental COVID-19 infection, when admitted in the hospital for an unrelated condition. Only 49 out of 112 patients had pneumonia like features requiring ICU care. The mortality rate was 54.5% and only 51 (45.4%) of patients were transferred out of ICU towards after recovery. One-fourth of the total study population had no comorbid conditions, whereas 35.7% had a single comorbidity. Around 39.3% of patients had 2 or more comorbid conditions on presentation. The nature of comorbidities has been summarized in table 1. Hypertension remained the most frequently observed condition (33.0%), followed by diabetes mellitus (19.6%) and cardiac disease (16.1%). Mean "days from symptom onset to hospital admission" was 2.28 ± 3.91 days and the mean LoS was 4.83 ± 3.76 days. Clinical picture of patients on admission to ICU is described in table 2. Majority of patients (78.6%) had some degree of ARDS on presentation to ICU (distribution illustrated in table 2), whereas 23.2% had normal PF ratio of > 300. Mean SOFA score on admission to ICU was 7.21 ± 3.90. Sixty-one patients out of 112 (54.5%) were received with invasive mechanical ventilation, 19.6% with oxygen via non-rebreathing masks, 17.9% with nasal prongs/venturi mask oxygen and 6.3% on room air.

Table 1. Demographic description of patients admitted to COVID ICU during third wave (n=112)

	Mean (SD) OR Number (%) (n = 112)
Mean AGE	50.94yrs (SD 20.1)
Age groups	
12-18 years	07 (6.3%)
19-40 years	31 (27.7%)
41-60 years	33 (29.5%)
> 60 years	41 (36.6%)
Sex distribution	
Males	69 (61.6%)
Females	43 (38.4%)
Presenting features	
SARI only	49 (43.8%)
Non-SARI / Incidental	63 (56.2%)
comorbidities	
None	28 (25.0%)
Single comorbidity	40 (35.7%)
2 comorbidities	25 (22.3%)
> 2 comorbidities	19 (17.0%)
Diabetes Mellitus	22 (19.6%)
Hypertension	37 (33.0%)
Diabetes and Hypertension both	15 (13.4%)
Heart disease	18 (16.1%)
CKD	14 (12.5%)
Hypothyroidism	08 (7.1%)
CVA	15 (13.4%)
Pregnancy	03 (2.7%)
Others	35 (31.3%)
Mean duration of symptoms before hospital admission	2.28 days (SD 3.9)
Mean LoS in ICU	4.83 days (SD 3.76)
Outcome	
Death	61 (54.5%)
Transfer out to ward/non-COVID ICU	51 (45.5%)

The last category of patients was admitted in ICU due to either haemodynamic instability, or for advanced nursing care. Only 2 patients were received on non-invasive ventilation (NIV). Approximately one-third of the patients (33.9%) required some vasopressor support (most commonly noradrenaline) during ICU stay. Eight-one patients (72.3%) were intubated in the ICU at some point, but 27.7% never required intubation and invasive ventilation. Laboratory investigations have also been elucidated in table 2. More than half the patients (56.8%) had leukocytosis (Total leukocyte count, TLC> 11000/cumm) on admission, whereas 2.7% exhibited leukopenia. Around 40% of the patients presented with a normal TLC. Neutrophil-lymphocyte ratio (NLR) has been extensively researched in COVID infected patients. In our study population, 14.3% of the patients had a normal NLR of < 3.2, 13.4% had a mildly elevated NLR (3.2-5), 44.6% had moderate elevation (NLR 5-10) and 27.2% had severely elevated NLR (> 10). Creatinine was elevated in 44.6% of the patients on admission. The mean procalcitonin level was 11.42 ± 17.51 and the distribution has been shown in the table 2. Severe elevation of procalcitonin was observed in 27 patients. Similarly, CRP (C-reactive protein) levels on admission, which were done in 105 patients, have been outlined in table 2. CRP levels of < 50 mg/L were seen in 23 patients, whereas 25 had values between 50 – 100. Higher levels of 100 – 200 and > 200 were exhibited by 43 and 14 patients respectively. Seven patients out of 105 (6.7%) had extremely high CRP of > 250. D-dimer levels, which have also been correlated with severity of disease in COVID, were available in 107 patients in our study. The normal levels considered were 135 – 250 ng/ml. Normal to low levels of D-dimer were seen in 29 (27.1%) patients and elevated levels seen in 78 (72.9%) patients.

Table 2. Clinical and laboratory picture upon admission in patients admitted to COVID ICU during third wave

	Mean (SD) OR Number (%)
SOFA on admission	7.21 (SD 3.90)
Oxygen device on admission	
Room air	7 (6.3%)
Nasal Prongs/Mask	20 (17.9%)
Non-rebreathing mask	22 (19.6%)
Non-invasive ventilation	2 (1.8%)
Invasive mechanical ventilation	61 (54.5%)
Vasopressor started in ICU	38 (33.9%)
Intubated in ICU	81 (72.3%)
Severity of ARDS (PF RATIO), n=112	
No ARDS (> 300)	26 (23.2%)
Mild (300-200)	32 (28.6%)
Moderate (200-100)	36 (32.1%)
Severe (< 100)	18 (16.1%)
TLC count (n=111)	
< 4000 /mm^3	03 (2.7%)
4000 – 11000 /mm^3	45 (40.5%)
> 11000 /mm^3	63 (56.8%)
NLR (n=112)	
< 3.2	16 (14.3%)
3.2 – 5	15 (13.4%)
5 – 10	50 (44.6%)
> 10	31 (27.7%)
Platelet count (n=110)	
< 1.5 L/mm^3	49 (44.5%)
1.5 – 4.0 L/mm^3	55 (50.0%)
> 4.0 L/mm^3	06 (5.5%)
Serum Creatinine (n=112)	
< 0.6 mg/dl	17 (15.2%)
0.6 – 1.2 mg/dl	45 (40.2%)
> 1.2 mg/dl	50 (44.6%)
Serum procalcitonin (n=104)	
< 0.5	31 (29.8%)
0.5 – 5	30 (28.8%)
5 – 10	16 (15.4%)
> 10	27 (26.0%)
C reactive protein (n=105)	
<50 mg/L	23 (21.9%)
50 – 100 mg/L	25 (23.8%)
100 – 200 mg/L	43 (40.9%)
200 – 250 mg/L	7 (6.7%)
> 250 mg/L	7 (6.7%)
Serum fibrinogen (n=107)	
150 – 450 mg/dl	105 (98.1%)
> 450 mg/dl	02 (1.9%)
D-Dimer (n=107)	
< 135 ng/ml	06 (5.6%)
135 – 250 ng/ml	23 (21.5%)
> 250 ng/ml	78 (72.9%)
Troponin-i (n=105)	
≤ 0.05	50 (47.6%)
> 0.05	55 (52.4%)
Pro-BNP (n=105)	
≤ 400	33 (31.4%)
> 400	72 (68.6%)

Table 3. Drug therapy started in ICU for COVID patients admitted during third wave

Drugs administered in ICU	Number (%)
Antiplatelet therapy (Ecosprin)	27 (24.1%)
Anticoagulation (UFH or LMWH)	69 (61.6%)
Insulin (sliding scale or infusion)	18 (16.1%)
Steroid – Hydrocortisone	29 (25.9%)
- Dexamethasone	41 (36.6%)
- Methylprednisolone	14 (12.5%)
Antibiotics – low grade	15 (13.4%)
- high grade	97 (86.6%)
Remdesivir	21 (18.8%)
HCQ / Favipiravir / Tocilizumab / Molnupiravir	NIL

Low grade antibiotics-amoxicillin-clavulanate, azithromycin, doxycycline; High grade antibiotics-3rd generation cephalosporins, piperacillin-tazobactam, teicoplanin, tigecycline, carbapenems, linezolid, vancomycin, polymyxins.

Table 4. Chi square tests applied to various patient variables to ascertain their correlation. The resultant p-values are tabulated above. A value of < 0.05 is considered significant association amongst variables

Variable	Tlc	Platelets	NLR	Creatinine	Fibrinogen	D-dimer	Procalcitonin	Trop I	Probnp	CRP	Outcome
Increasing age	0.725	0.056	0.075	0.499	0.789	0.65	0.578	0.705	0.006	0.044	0.046
Male sex	0.236	0.472	0.351	0.003	0.753	0.296	0.155	0.702	0.853	0.135	0.012
Sari on presentation	0.245	0.081	0.727	0.359	0.976	0.695	0.077	0.316	0.849	0.564	0.29
Presence of any comorbidity	0.558	0.414	0.047	0.453	0.416	0.136	0.002	0.236	0.168	0.559	0.584
Diabetes & hypertension	0.016	0.605	0.692	0.159	0.58	0.437	0.537	0.702	0.138	0.336	0.644
Cad	0.716	0.395	0.875	0.59	0.535	0.42	0.465	0.049	0.076	0.685	0.919
Ckd	0.2	0.291	0.308	0.002	0.58	0.437	0.156	0.338	0.138	0.008	0.053
Administration of remdesivir	0.054	0.142	0.238	0.032	0.481	0.638	0.261	0.076	0.702	0.824	0.236
Anticoagulation	0.773	0.062	0.835	0.78	0.688	0.719	0.193	0.208	0.68	0.286	0.074
High grade antibiotics	0.116	0.592	0.998	0.002	0.58	0.002	0.396	0.055	0.322	0.029	0.02
Severity of ards (pf ratio)	0.223	0.605	0.673	0.838	0.976	0.818	0.338	0.702	0.261	0.115	0.003
Length of icu stay	0.416	0.414	0.714	0.629	0.156	0.242	0.919	0.129	0.538	0.688	0.30
Mortality	0.722	0.112	0.001	0.453	0.077	0.001	0.853	0.766	0.087	0.001	-

Out of these 78, 37 patients had D-dimer over 1000 ng/ml and 9 amongst these had levels over 2500. Upon analysing treatment in ICU (table 3), out of 112 patients, low grade antibiotics wereadministered to 15 (13.4%) patients and higher antibiotics to 97 (86.6%) patients. Remdesivir therapy was given to 18.8% of patients, but no patient was given tocilizumab therapy. Steroid cover was provided to 84 patients, out of which41 received dexamethasone, 14 received methyl-prednisolone and 29 received hydrocortisone. The majority of patients who received hydrocortisone were administered a septic shock dose of 200mg/day. Anticoagulation (unfractionated heparin, UFH or low molecular weight heparin, LMWH) was started in 69 (61.6%). Twenty seven patients received aspirin in ICU, primarily as prophylaxis for cardiac or cerebrovascular disease. Chi square test was used to analyse association between patient variables, as can be seen in table 4. It can be observed from the table that increasing age had a positive correlation with increasing pro-BNP levels, CRP levels and mortality ($p < 0.05$). A similar association was noticed between male sex andoutcome, with higher mortality in males than females. Positive correlations was seenbetween presence of comorbid conditions and higher NLR, and between presence of comorbidities and raised procalcitonin levels. It was also noted that patients with higher NLR on admission had a higher mortality rate ($p <0.001$), but no correlation was seen between NLR and severity of ARDS or LoS. When creatinine levels on admission were plotted, they were found to have positive association with male sex, diabetes, administration of remdesivir and administration of higher antibiotics. High CRP levels on admission were found to be associated with requirement of high grade antibiotics and mortality ($p <0.001$). Severity of ARDS and requirement of higher antibiotics also showed an association with the mortality rate. Higher D-dimer levels on admission also indicated a poor patient outcome ($p <0.001$), but had no correlation with severity of ARDS on admission or with LoS. ROC (Receiver Operating Curve) analysis was used to identify optimal cut-off value of NLR, CRP and D-dimer on admission to differentiate survivors from non-survivors and predict mortality. An NLR value of 6.57 on admission was identified as optimal cut-off to predict mortality (Area under ROC, AUROC= 0.771, standard error 0.046, 95% CI 0.682-0.861, $p <0.001$). NLR value more than 6.57 had a sensitivity of 0.803 and specificity of 0.667 in predicting mortality by COVID-19 in ICU patients. Similarly, upon evaluation of ROC for CRP, a cut-off value of 87.5 mg/L was found acceptable to predict mortality with a sensitivity of 0.982 and specificity of 0.878 (AUROC = 0.983, standard error 0.012, 95% CI 0.959-1.000, $p <0.001$).

D-dimer ROC revealed a cut-off value of 408.50ng/ml for differentiation of survivors and non-survivors with a sensitivity of 0.947 and specificity of 0.84 in predicting mortality (AUROC = 0.979, standard error 0.013, 95% CI 0.954-1.000, $p <0.001$).

DISCUSSION

SARS-CoV-2 virus has become one of the most studied microbes in recent times. Over the course of the pandemic, many different strains of the virus have been observed, which have major and/or minor variations in their properties. The omicron strain of SARS-CoV-2 is theorized to be highly transmissible, but less virulent, with varied symptomatology. Saxena *et al*[6] published a study from Lucknow, India, in which the authors have characterized the omicron strain of SARS-CoV-2 virus and detailed its mutational hotspots. They have concluded variations in the spike glycoproteins amongst variants makes them more readily transmissible and the use of coronavirus-specific attachment inhibitors may be futile in treatment. Similarly, in an editorial published by Dhawan *et al*[7], reasons for emergence and high transmissibility of the virus were highlighted. It was theorized that the virus may spread more readily than other variants due to either increased viral shedding, increased contagious window, increased binding to host receptor or increased environmental stability.

Multiple authors have been published the epidemiological and clinical profile of patients infected with omicron variant of SARS-CoV2. Many such studies have compared patient demographics, clinical profile, and outcome with previous variants, especially delta. Upon comparing our findings with some of other publications, we found many similarities and some differences. Ward *et al*[8]published a comparative study of COVID-19 related deaths due to omicron and delta variants in the United Kingdom. They reported that the risk of death was 67% lower for omicron compared to the delta variant and this reduction in mortality rate was more pronounced in males than in females and in older population (> 70 years of age) as compared to the under 70 age group. They also found a positive correlation between booster COVID vaccination and survival after omicron infection. Leiner*et al*[9] published an epidemiological study of omicron infected patients in Germany. They reported a higher incidence of micron infection in younger age group, females and patients with lower comorbidity burden. They also compared their findings with delta infection and found a lower risk of ICU admission, mechanical ventilation and in hospital mortality.

A similar finding was reported by Bager *et al*[10] in Denmark. They found that hospitalizations and case fatality was less with omicron strain than with delta variant of SARS-CoV2 virus in both vaccinated and unvaccinated individuals. In a report published by Adjei *et al*[11] from United States, the authors reported a crude mortality rate of 4.9%, as compared to 15.1% during delta infection period. Majority of deaths were found to be in elderly (> 65 years) age group and in individuals with 3 or more underlying medical conditions. The authors recommended vaccination, early diagnosis, and non-pharmaceutical supportive care as important public health priorities to tackle the worldwide waxing waning COVID pandemic. A retrospective case-control study conducted by Suzuki *et al*[12] in Japan between patients infected with omicron and delta strains presented some insights into their clinical and laboratory picture. The authors reported that the number of patients with overt pneumonia or those requiring oxygen therapy, hospital admissions, or both was significantly lower in the omicron group. Levels of inflammatory markers such as lactate dehydrogenase (LDH), ferritin, C-reactive protein (CRP), aspartate aminotransferase (AST), and NLR were significantly lower in patients infected with omicron. Similar findings regarding inflammatory markers were reported by Wang *et al*. [13] A retrospective observational analysis by Guo *et al*[14]showed that serum IL-6 levels may be used to predict the severity of disease in patients with omicron variant infection, and after vaccination, the rise in levels of inflammatory indicators was significantly reduced. Gu *et al*[15] presented clinical data from 116 omicron infected patients and compared it with data from 87 COVID cases from 2020. It was seen that omicron cohort clustered in relatively younger population and had more asymptomatic cases as well as extrapulmonary presentation. They also reported that although ground glass opacities were present in both groups on computed tomography (CT) of chest, crazy-paving pattern was less in omicron infected population. Interestingly, SOFA scores were higher in omicron group, which can be explained by either extrapulmonary manifestations or incidental/asymptomatic omicron infection in otherwise sick/admitted patients.

We observed some limitations in our study. Our sample size was small (n=112), which was probably because of less virulence of omicron variant in the third wave. This resulted in less hospital and ICU admissions. Also, only moderate, and severe infections were admitted to ICU and hence, were included in the study. More importantly, many patients with non-respiratory symptomatology could be categorized as incidental COVID during this period. Such patients presented with/were admitted in hospital due to non-COVID reasons and contracted COVID infection simultaneously. The fact whether their presenting features were non-SARI manifestations of COVID or COVID was incidental can be debated. Another lacuna noted was the vaccination history which could not be gathered from patients' relatives in a significant proportion of patients, and hence was excluded from analysis. Finally, few patients received in our ICU were referred from other hospitals and had poor general condition and high SOFA scores on admission. Such patients did not respond to intensive care and expired within a few hours of ICU admission. The strength of our study however remains in the comprehensive data gathered from the 112 participants including demographics, clinical picture on admission and laboratory profile. We also followed up on the treatment received in ICU and tried to correlate all variables with patient outcome and LoS.

Conclusion

In conclusion, the authors wish to highlight that new strains of SARS-CoV2 virus may keep emerging and bringing new features into the pandemic. The omicron variant probably had lower virulence and higher transmissibility than the delta variant, as can be deduced by lower incidence of severe infection and higher proportion of incidental COVID infections, in otherwise sick/hospitalized patients. However, NLR, CRP and D-dimer continue to increase in infected patients and show a correlation with LoS and mortality, as these are primarily pro-inflammatory markers. More studies would be needed to assess correlation between vaccination and patient outcome.

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Vardhman Mahavir Medical College and Safdarjung Hospital has been at the forefront of the fight against COVID-19, with a huge dedicated COVID block and 65 bedded adult COVID ICU. Our doctors, nursing and supportive staff have worked diligently to care for these patients. This article is dedicated to all healthcare workers who are involved tirelessly in this pandemic.

List of Abbreviations

ACE2	Angiotensin-Converting Enzyme 2
ARDS	Acute Respiratory Distress Syndrome
CDC	Center for Disease Control and Prevention
COVID-19	Coronavirus disease 2019
CRP	C-Reactive Protein
DLC	Differential Leucocyte Count
GCS	Glasgow Coma Score
ICU	Intensive Care Unit
IL-6	Interleukin-6
NLR	Neutrophil Lymphocyte Ratio
PaO_2	Partial pressure of oxygen in arterial blood
$PaCO_2$	Partial pressure of carbon dioxide in arterial blood
PR	Pulse Rate
RAT	Rapid Antigen Test
RT-PCR	Reverse Transcriptase – Polymerase Chain Reaction
SARI	Severe Acute Respiratory Infection
SBP	Systolic Blood Pressure
SOFA	Sequential Organ Failure Assessment
TLC	Total Leucocyte Count
WHO	World Health Organization

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