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The evolving landscape of COVID-19: Characteristics and factors associated with disease severity and mortality in recent hospitalisations

D. Zaçe1, A. Çekrezi1, E. Teti1, V. Malagnino1, L. Sarmati1, M. Iannetta1, A.M. Geretti1,2,3

1 Department of Systems Medicine, Infectious Disease Clinic, Tor Vergata University, Via Montpellier, 1 - 00133 Rome, Italy

2 Dept of Infection, North Middlesex University Hospital, London, UK

3 School of Immunity and Microbial Sciences, King's College London, London, UK

Introduction

- COVID-19 remains a complex and dynamic global health challenge, requiring continued efforts in prevention and treatment.
- As the characteristics of affected patients evolve with successive waves of the pandemic, this study aims to analyse the demographic and clinical profiles and summarise the outcomes of patients hospitalised for COVID-19 between 1st November 2023 and 31st January 2024.

Study Design

- This was a single-center, observational, retrospective study

Methods

- The primary outcome was hospital discharge vs. in-hospital mortality.
- Variables analysed included demographic, clinical and laboratory parameters.
- Oxygen requirements were classed as none, Venturi mask, and high-flow nasal cannula or non-invasive ventilation (HFNC/NIV).
- Statistical analyses employed Mann-Whitney/Kruskal-Wallis tests for continuous variables and Fisher's exact test for categorical variables.

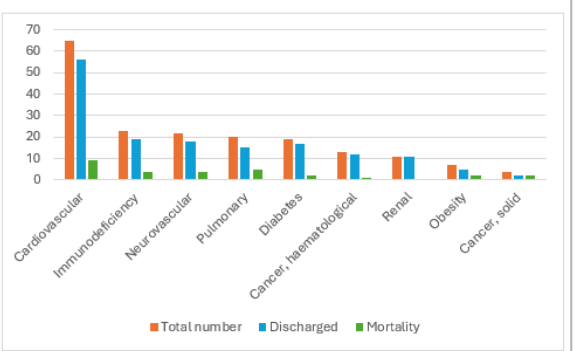
Results

- A total of 86 patients were hospitalised for COVID-19 between 1st November 2023 and 31st January 2024.
- All had at least ≥1 nasopharyngeal swab (NPS) positive for SARS-CoV-2 by antigenic test.
- The median age was 77 years, with a slight predominance of males (n=51, 59%).
- The majority (82/86, 95%) had received ≥1 COVID-19 vaccine dose, with a median of 22 months elapsing between the last vaccine dose and the onset of symptoms.

Comorbidities

- The median Charlson comorbidity index (CCI) was 5
- Cardiovascular disease was the most prevalent comorbidity.

Figure 1 Comorbidities of the studied population



Results of 2

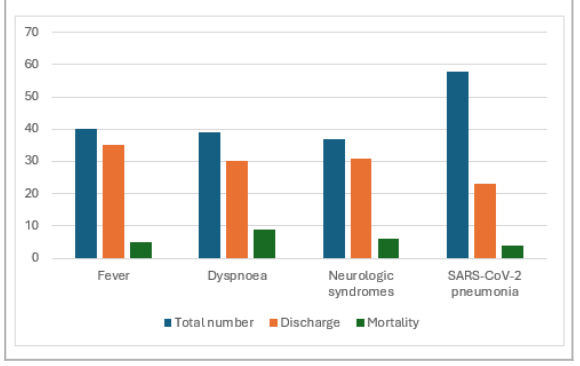
Admission

- Fever and dyspnoea were the most common presenting symptoms.
- SARS-CoV-2 pneumonia was documented by CT scan in 58 (67%) patients.

Outcome

- Overall, 72/86 (84%) patients recovered and were discharged after a median of 7 days [IQR 4-11]
- The in-hospital mortality rate was 14/86 (16%) and occurred after a median of 17 days [IQR 5-26]

Figure 2 Symptoms at admission



Results of 3

- Comparing the two groups, there was no apparent difference in age, sex, SARS-CoV-2 vaccination status, CCI, and clinical presentation at admission.
- The in-hospital mortality group had higher neutrophil to lymphocyte ratio (NLR) and D-Dimer and procalcitonin levels on admission; higher oxygen requirements during admission (although none progressed to mechanical ventilation); and protracted SARS-CoV-2 NPS positivity.
- In this group, all received remdesivir, typically alongside corticosteroids

Table 1 Laboratory values at admission

Laboratory values at admission	Total (n=86)	Discharge (n=72)	Mortality (n=14)	P-value
WBC,median cells × 10^9/L (IQR)	7.6 (5.1-9.9)	7.3 (4.9-9.9)	9.2 (5.4-11.8)	0.443
Neutrophil(N) count, median cells × 10^9/L (IQR)	5.8 (3.5-8.3)	5.5 (3.4-8.0)	7.8 (5.7-10.3)	0.063
Lymphocyte(L) count, median cells × 10^9/L (IQR)	0.9 (0.5-1.3)	0.9 (0.5-1.4)	0.7 (0.4-1.1)	0.141
NL ratio, median (IQR)	6.6 (3.2-11.2)	5.7 (3.1-9.5)	13.5 (7.3-15.1)	0.003
Monocytecount, mediancells × 10^9/L (IQR)	0.5 (0.3-0.7)	0.5 (0.4-0.7)	0.5 (0.3-0.6)	0.7
CD3+ median cells/mcL (IQR)	771 (423-1014)	788 (429-1029)	561 (315-836)	0.128
CD3+/CD4+ median cells/mcL (IQR)	407 (243-609)	422 (243-629)	319 (221-481)	0.214
CD3+ CD8+ median cells/mcL (IQR)	235 (121-381)	235 (130-235)	224 (84-281)	0.374
CD19+ median cells/mcL (IQR)	57 (30-116)	53 (29-16)	60 (36-110)	0.9
CD4 CD8 ratio	1.9 (1.1-2.9)	2.04 (1.1-3.1)	1.6 (1.2-2.1)	0.41
D-Dimer, median ng/mL (IQR)	1475 (818-2792)	1209 (771-2505)	3230 (1755-4363)	0.02
Procalcitonin, median pg/mL (IQR)	0.2 (0.05-1.15)	0.18 (0.05-0.65	0.97 (0.11-2.84)	0.078
C-Reactive Protein, median mg/mL (IQR)	106 (45-168)	104 (45.3-152)	143 (25.6-185.1)	0.455

Conclusions

- Despite high vaccine coverage, there remains an older population at increased risk of unfavourable COVID-19 related outcomes.
- Baseline laboratory data (NLR, D-dimer, procalcitonin), high oxygen requirement, and ongoing SARS-CoV-2 shedding despite antiviral therapy provide useful prognostic parameters.
- The extended period since the last vaccination in the hospitalised population supports concept that the elderly may benefit from more frequent booster doses.

References

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2. Del Rio, C., Omer, S. B., & Malani, P. N. (2022). Winter of Omicron - The Evolving COVID-19 Pandemic. *JAMA*, *327*(4), 319–320. https://doi.org/10.1001/jama.2021.24315