

ICU outcomes of COVID-19: A National Cohort study from Malta

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Introduction

The COVID-19 virus has caused a massive strain on medical services worldwide. Throughout 2020 and 2021, hospitals and their Intensive Care Units (ICUs) have been inundated with patients suffering from critical illness due to COVID-19, many of whom developed multi-organ failure and required prolonged ICU stays. Malta is a Mediterranean island with a population of 500,000 people, with one main acute general hospital (Mater Dei Hospital) with a single 20-bed ICU. This meant that the COVID-19 pandemic surge had to be managed locally by increasing ICU capacity without access to a referral network of other hospital ICUs at different phases of the pandemic or the possibility of referral to ECMO services abroad.

Objectives

Establish the demographics and outcomes of all patients admitted to ICU with COVID-19 in Malta.

Methods

A single centre prospective observational cohort study conducted in the Intensive Care Units caring for COVID-19 patients at Mater Dei Hospital, Malta. Data was collected on admission and then daily until death or discharge from ICU.

Results

The COVID-19 pandemic resulted in 252 patients being admitted to ICU from March 2020 to May 2021. The peak of admissions occurred in March 2021 with a maximum of 21 admissions in a week resulting in a peak of 33 COVID-19 ICU beds being utilized. This represents 165% of the normal 20 bed ICU capacity. There were 9 readmissions, these were excluded from data analysis. All patients admitted to ICU were treated with Dexamethasone and Remdesivir, and Tocilizumab from January 2021, unless contraindicated.

Overall ICU mortality was 34% and increased to 46% in those requiring mechanical ventilation. Males were responsible for 75% of admissions but gender was not associated with ICU mortality. Older patients and those with ischemic heart disease (IHD) and diabetes had a significantly increased mortality as were those patients with a higher Sequential Organ Failure Assessment (SOFA) and lower PaO₂/FiO₂ (P/F) on admission (Table 1).

The total number of patients requiring intubation during their admission was 173 (69%) with a median time to intubation of 2 days [IQR 1-4]. Proning was used for 124 (69%) of the mechanically ventilated patients for a median of 2 days per patient [IQR: 1 - 3], similarly muscle relaxant infusion was also used in 124 of mechanically ventilated patients (69%) for a median of 3 days per patient [IQR: 2 - 5]. The median duration of mechanical ventilation was 11 days [IQR: 6 - 22.2] with a maximum of 63 days. Tracheostomies were performed in 59 (34%) of mechanically ventilated patients with a median duration of 14.5 days intubated prior to tracheostomy [IQR: 13 - 17]. The median length of stay was 11.5 days [7-23].

	All Patients	28 Day Status	
		Alive	Dead
Number (%)	252	166 (66)	86(34)

Demographics				P-Value
Age [IQR]	67 [61-73]	65 [57-72]	71 [67-76]	<0.001
Male(%)	188 (75)	124 (75)	64 (74)	1
BMI >35 (%)	37 (15)	22 (13)	15 (17)	1
Ischemic Heart Disease (%)	47(19)	21 (13)	26 (30)	0.001
Hypertension (%)	151 (60)	92 (55)	59(69)	0.057
Diabetes (%)	94(37)	54 (33)	40 (47)	0.039
Immunosuppression(%)	4 (2)	2 (1)	2(2)	0.61

First 24-Hours				
SOFA score	2 [2-3]	2 [2-3]	3 [2-4]	<0.001
P/F ratio [IQR]	96 [77-129]	101 [80-135]	87[71-114]	0.012

Organ Support During admission				
Continuous Renal Replacement Therapy (%)	50 (20)	17 (10)	33(48)	<0.001
Mechanical Ventilation (%)	173(69)	94(57)	79(92)	<0.001

Table 1. Demographic and clinical status according to 28-day survival status. Continuous values reported as median with [Interquartile Range] and Kruskal Wallis test performed. Categorical values expressed as number (%) and Fisher exact test used.

Fig 1 a. COVID-19 ICU 28-day mortality (%) according to age

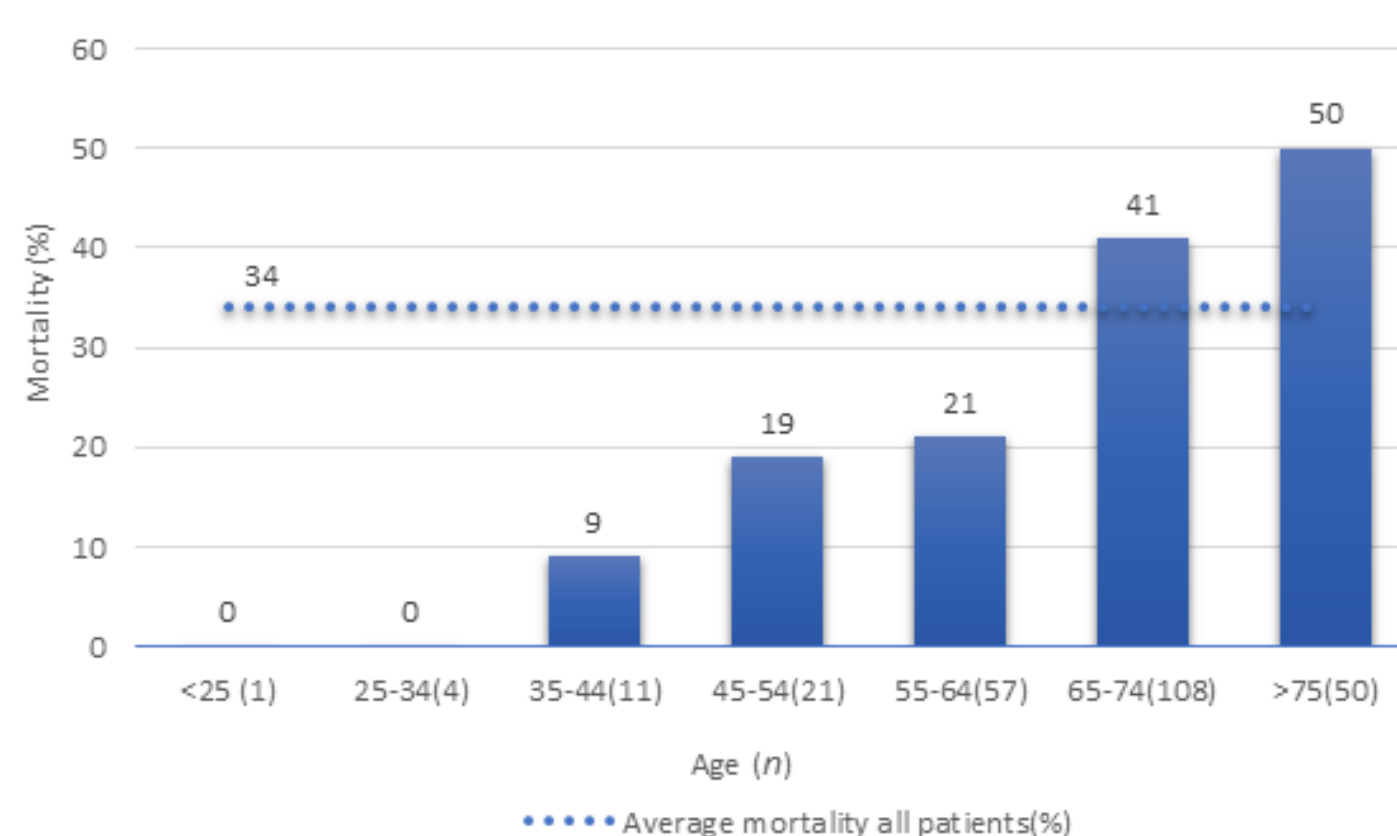
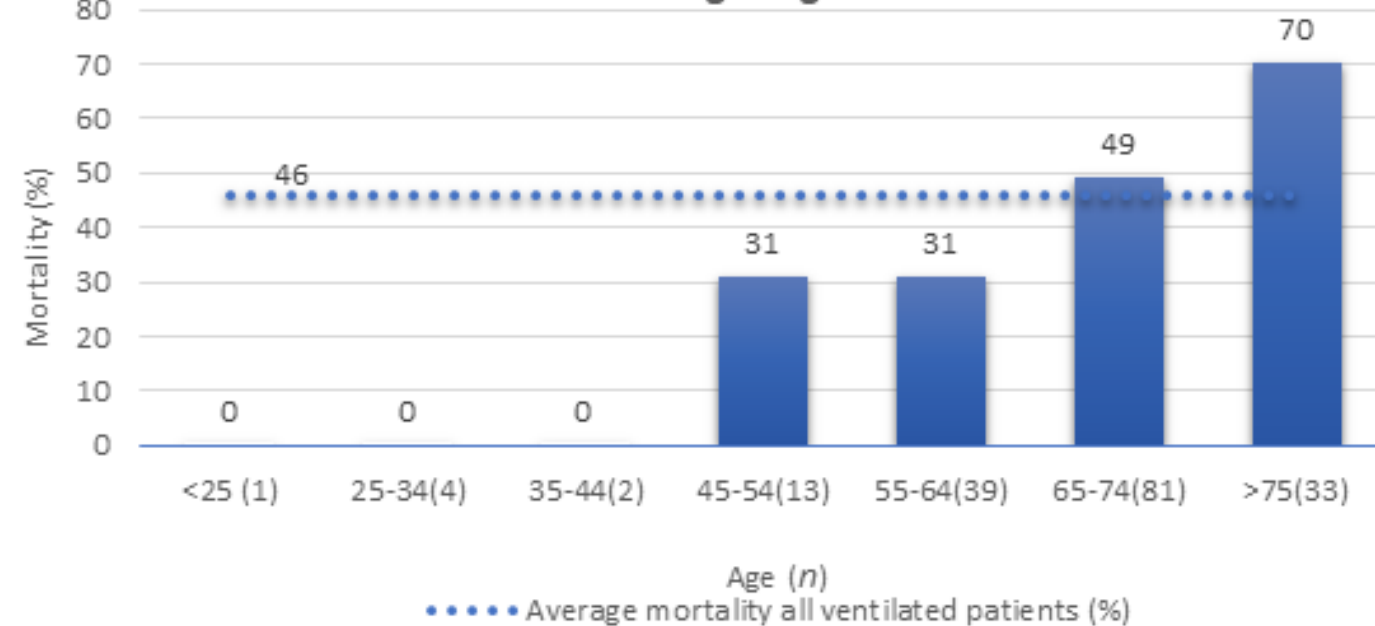


Fig 1 b. COVID-19 ICU 28-day mortality (%) in ventilated patients according to age



Conclusions

This observational study represents all COVID-19 ICU admissions that occurred in Malta from March 2020 to May 2021 in the single institution caring for these patients in the country. We have demonstrated a predominantly male, elderly admission population with an increased mortality associated with age, ischemic heart disease and diabetes. Overall ICU mortality was 34% and 46% in ventilated patients, which is comparable to that found in other national databases.

References

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