Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Heavy burden of COVID-19–related mortality among the elderly in Corsica, 2020–2021

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To the editor

The first cases of the ongoing COVID-19 pandemic were identified in France in January 2020 and on February 28, 2020, in Corsica, an island situated in the Mediterranean Sea. A major outbreak hit the ultra-peripheral region early following the return of three cases from religious gatherings in mainland France. Corsica has one of the oldest populations in the world and a limited bed capacity in its two hospitals. Therefore, the healthcare systems were rapidly overwhelmed by the influx of difficult-to-transfer patients, in particular, elderly cases. A dedicated medical boat of the French Army Health Service transferred some patients from Corsica to the less-saturated hospitals in mainland France [1]. The elderly, in particular, have paid a heavy burden with the high COVID-19–associated mortality.

Our priority was to estimate the mortality predictors that could be a target to curb the high mortality observed in the elderly at the General Hospital of Ajaccio. A retrospective cohort study of all adult inpatients with SARS-CoV-2 infection was conducted in the referral centre in which 50 beds were available for the COVID-19 conventional unit (CU) and 20 beds were available for the intensive care unit (ICU) for a catchment area of approximately 162 400 inhabitants.

Patients' data were retrieved from the hospital information system during the first (28 February, 2020, to 25 April, 2020) and second waves (10 November 2020, to 21 February 2021). The Kaplan-Meier method and Cox regression model allowed survival analysis and estimated hazard ratios with their 95% CIs. The ethical committee of the French-speaking Society of Infectious Diseases (IRB00011642) approved the study (N2022-0503).

Of 267 inpatients, 12 were transferred and 255 were included in the cohort. No difference was observed in age and severity between the transferred group and study cohort. The median age was 83 years (interquartile range: 69–94 years), and 142 (56%) patients were aged ≥80 years. On admission, 141 of them were dyspnoeic, 51 presented hypoxia and 130 had serum C-reactive protein (CRP) level of >50 mg/L. Of them, 189 patients were hospitalised in the CU and 66 (26%) in were hospitalised in the ICU where they received more high-flow oxygen or invasive mechanical ventilation. ICU hospitalization has been associated with a better survival of patients with COVID-19 compared with CU hospitalization, as observed in another study [2]. However, in the context of limited ICU bed capacity, all patients with severe COVID-19 could not be admitted to the ICU, especially those with asymptomatic hypoxia. In addition, asymptomatic hypoxia was more common in the elderly than in younger individuals. Thus, only 39% of the patients in the ICU were aged ≥80 years, compared with 61% who were younger. Therefore, the overall mortality rate observed for those aged >80 years was 82%, whereas it was 8% for those aged <70 years (Table 1).

Age, male sex and comorbidities were the mortality risk factors described. Unfortunately, they are non-modifiable predictors.

In this study, hypoxia (relative risk, 2.5; 95% CI, 1.4–4.4) and CRP level of >100 mg/mL (relative risk, 1.7; 95% CI, 1.0–2.9) were independently associated with mortality.

Asymptomatic hypoxia is related to the atelectasis effects of the lung, resulting in damage to the receptors linked to the sensation of hypoxia. The monitoring of hypoxia is easily accessible on

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Table 1
Comparison of characteristics between survivors and non-survivor inpatients with COVID-19: the COCORICO study

Characteristics	Total	Survivors	Non-survivors	p
	($n = 255$)	($n = 190$)	($n = 65$)	
Demographic characteristic, *n* (%)				
Male sex	141 (55.3)	96 (50.8)	45 (68.2)	0.01
Age class (y)				<0.0001
<70	66 (25.9)	61 (32.3)	5 (7.6)	
70–80	47 (18.4)	40 (21.2)	7 (10.6)	
>80	142 (55.7)	88 (46.5)	54 (81.8)	
Comorbidities, *n* (%)				
Hypertension	131 (51.4)	87 (33.6)	44 (66.4)	0.003
Diabetes	58 (22.8)	41 (21.7)	17 (25.8)	0.49
Dyslipidaemias	43 (16.9)	30 (15.9)	13 (19.7)	0.56
Chronic obstructive pulmonary disease	43 (16.8)	27 (14.3)	16 (24.2)	0.06
Coronary heart disease	39 (15.6)	27 (14.4)	12 (19.1)	0.38
Heart rhythm disorder	45 (17.8)	25 (13.4)	20 (30.3)	0.002
Carcinoma	43 (16.9)	29 (15.4)	14 (21.2)	0.28
Vital signs on admission, *n* (%)				
Hypoxia	43 (16.9)	25 (13.2)	18 (27.3)	0.008
Fever	83 (32.5)	60 (31.7)	23 (34.8)	0.64
Fatigue	71 (27.8)	59 (31.2)	12 (18.2)	0.05
Cough	99 (38.8)	83 (43.9)	16 (24.2)	0.004
Shortness of breath	141 (55.3)	100 (52.9)	41 (62.2)	0.19
DP < 90 mm Hg	232 (91.0)	175 (92.6)	57 (86.4)	0.07
Laboratory findings, *n* (%)				
White blood cell count ≥10 g/L	48 (18.8)	27 (14.3)	21 (31.8)	0.002
Lymphocytes <1.5 g/L	252 (98.8)	187 (98.9)	65 (98.5)	0.76
Blood platelet count <120 g/L	30 (11.8)	22 (11.6)	8 (12.1)	0.91
D-dimer level >0.5 mg/mL	45 (17.6)	32 (16.9)	13 (19.7)	0.61
APT time ratio >1.2	48 (18.8)	25 (13.2)	23 (34.8)	0.0001
Creatine kinase level >200 UI/L	7 (2.8)	3 (1.6)	4 (6.0)	0.07
Lactate dehydrogenase level >215 UI/L	31 (12.2)	15 (7.9)	16 (24.2)	0.001
ProBNP >125 ng/mL	59 (23.1)	36 (19.1)	23 (34.8)	0.008
Creatininemia >10 mg/L	102 (40.0)	57 (30.2)	45 (68.2)	<0.0001
CRP level >50 mg/L	130 (51.0)	83 (43.9)	47 (71.2)	0.0001
Hospital-acquired COVID-19	40 (15.7)	22 (11.6)	18 (27.3)	0.002

COCORICO, COrsica COhorte Retrospective des Infections à Sars-COv-2; DP, diastolic pressure; APT, activated partial thromboplastin time; LDH, lactate dehydrogenase; pro-BNP, pronatriuretic peptide; CRP, C-reactive protein.

admission and could be targeted early with oxygen (standard or high-flow nasal) therapy to lower the COVID-19–associated mortality [3]. The host inflammatory response or cytokine storm stage often follows the initial pathogenic viral response during COVID-19. In this phase, inflammatory and immuno-pathological reactions against SARS-CoV-2 have a more severe impact than the viral activity itself. Increased levels of inflammatory biomarkers are associated with increased severity and mortality. Serum CRP is one of the easily accessible inflammatory biomarkers. Upon admission of patients, the estimation of CRP level could help caregivers closely monitor patients with severe COVID-19 and introduce corticosteroid therapy early, which could reduce the COVID-19–associated mortality [4].

When analysing the burden of COVID-19 during the outbreaks, the overall mortality rate decreased from 29% (40/136) during the first wave (SARS-CoV-2 wild-type or Wuhan-Hu-1) to 22% (26/119) during the second wave (α-type) (Table S1). This may be analysed in parallel with the increasing use of oxygen and corticosteroid therapies between the two waves. The standard oxygen therapy rate decreased from 75% to 70%, whereas high-flow oxygen therapy increased from 25% to 30%, respectively, during the first and second waves. Moreover, the corticosteroid therapy rate increased from 3% during the first wave to 51% during the second wave. Apart from corticosteroid therapy, the use of tocilizumab and other antiviral treatments was infrequent in this study.

Our study had some limitations. This was a single-institution study, which makes the generalizability of the findings difficult. Because of the retrospective nature of the study design, one should take into account some biases inherent to retrospective studies.

Finally, in the context of limited bed capacity in isolated territories, hypoxia and CRP level, parameters that are easily accessible upon admission, could be targeted early with oxygen and immunomodulatory agents to reduce the high COVID-19–associated mortality observed in the elderly.

Author contributions

Y.F., A.M. and T.G. designed the study and had full access to all data. D.B. performed the virological analysis. T.G. and A.M. collected the data. A.M. performed the statistical analysis. T.G., Y.F. and A.M. interpreted the data and wrote the first draft of the manuscript. All authors have reviewed the manuscript and approved the final version of the article.

Transparency declaration

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cmi.2022.11.018.

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