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Oldest-old Covid-19 patients: Lessons learnt in a geriatric intermediate care unit



Oldest-old patients (> 80yo) with coronavirus disease 19 (COVID-19) are at higher risk of acute respiratory distress syndrome (ARDS) and death [1]. They are also less likely to be admitted in an intensive care unit (ICU) for intubation due to beds shortage in a pandemic context [2]. In addition, the benefit of prolonged mechanical ventilation remain uncertain in such a population, not only due to the severity of respiratory distress by Sars cov 2 infection, but also by the consequences of invasive mechanical ventilation and prolonged sedation, such as delirium and sarcopenia. COVID-19 pneumonia can lead to an ARDS pattern but with some specificity. Distinctive features are severe hypoxemia often associated with near normal respiratory system compliance. Recrutability by positive pressure seems effective in most of the case. Hypercarbia is rare, excepted among COPD patients. Thus, for oldest-old patients not eligible for intubation, an admission in an intermediate care unit (IMCU) for non-invasive therapy such as High Flow Nasal Cannula (HFNC) and Continuous Positive Airway Pressure (CPAP) could be an alternative [3,4,5,6].

We report our experience of the 4-bed geriatric IMCU located inside the geriatric hospital (166 acute care beds) of the Geneva University Hospitals, in Switzerland. From March 13 to May 11, 2020, 20 patients were admitted to the IMCU (median age 87.1 [83–91], 70% male). They accounted for 8.5% of the 235 COVID-19 patients admitted in the geriatric hospital with an updated goal of care excluding an intubation for invasive ventilation. Clinical criteria for IMCU admission were respiratory rate (≥ 20 /min), oxygen saturation ($< 92\%$) with $32\% \text{ FiO}_2$ or more, and oxygen supply necessary ($\text{FiO}_2 > 32\%$ or increased oxygen needs with dyspnea worsening). The main diagnosis was hypoxemic Sars-Cov2 pneumonia (75%), associated with acute heart failure in 60% of them. The mean PaO_2 at admission was 9.8 ± 2.5 kPa with a FiO_2 ranging from 35 to 90%, with a mean $\text{PaO}_2/\text{FiO}_2$ of 23.6 ± 7.5 kPa. The mean score for Simplified Acute Physiology Score (SAPS II) was 41.6 ± 5.5 (0–163) and for Sequential Organ Failure Assessment (SOFA) was 4.5 ± 1.5 (0–24) [7,8]. Management consisted of a combination of CPAP (17) and/or HFNC (13) (to reach an objective of $\text{SpO}_2 \geq 92\%$), with respiratory physiotherapy and early mobilization for all patients. Drug therapies were diuretics (18) and antibiotics (16). At 30 days from IMCU admission, 10 patients deceased, 8 were discharged from the hospital to their previous place of living and 2 remained hospitalized for rehabilitation. Demographics and clinical data were not different comparing survivors and deceased. (Table 1).

For each patients, goals of care were discussed at admission in the context, taking account patient's wishes, advance care planning when presents. Only people with do not resuscitate order and do not intubate order could be admitted to IMCU. Each admission was assessed together by physicians in charge of the patient in the acute geriatric ward and by the IMCU medical team, taking account frailty and adherence to treatment. Frailty was estimated by the Clinical Frailty Score, the level of dependency before admission, actives comorbidities, nutrition score (NRS). Multidisciplinary team, including nurses, physiotherapists, medical team, and palliative care team, made this assessment.

Table 1

Demographics and clinical data comparing survivors and deceased COVID-19 patients admitted in IMCU.

	Survivors	Deceased	Total
	N = 10	N = 10	N = 20
Age, year Median [IQR]	87.6 [83.1–90.3]	86.1 [81.9–91.2]	87.1 [82.8–90.6]
Length of stay, days median [IQR]	4.0 [3.0–5.0]	5.5 [4.0–7.0]	4.0 [3.0–7.0]
Sexe (F/M)	4/6	2/8	
SAPS2 ^a	43.5 (39.3–47.7)	38.7 (33.1–43.8)	41.1 (35.6–46.6)
SOFA ^b	3.7 (2.2–5.2)	4.8 (3.3–6.3)	4.3 (2.8–5.8)
PaO ₂ /FiO ₂	22	19	20.5
Associated diagnosis N (%)			
Heart failure	6 (60%)	6 (60%)	12 (60%)
Bacterial pneumonia	2 (20%)	2 (20%)	4 (20%)
Other	1 (10%)	2 (20%)	3 (15%)
Frailty clinical score ^c	4.5 [3.5–6.0]	6.0 [5.5–6.5]	5.5 [4.5–6.5]

^a SAPS2: Simplified Acute Physiology Score (0–163) [7].

^b SOFA: Sequential Organ Failure Assessment (0–24) [8].

^c (Data's missing for 2 patients in each group).

In our experience, half of the oldest-old Covid-19 patients admitted in the IMCU with bad prognosis with acute respiratory distress survived. They benefitted from a combination of CPAP and/or HFNC in association with physiotherapy and early mobilization. In addition, heart failure was very prevalent and concomitant with Covid-19 pneumonia. This challenging differential diagnosis of ARDS required cautious management and was facilitated, in our experience, by daily bedside lung ultrasound.

In our knowledge, our series is the first one suggesting that the association CPAP/HFNC can be efficient in hypoxemic respiratory distress among oldest-old Covid-19 patients (mean age 87 yo) [9]. Furthermore, the multidisciplinary team in a geriatric center helped to take into account patient frailty and comorbidities.

We were not able to detect risk factors of better outcomes; further studies concerning bigger numbers of patients are necessary to identify a clinical pattern of oldest-old Covid-19 patients who can benefit from IMCU non-invasive management. Our results highlight the importance of an early scale-up capacity in IMCU beds and staff during the COVID-19 pandemic that should take into account the specific population of the oldest-old.

Impact statement

Dear editor,

We are very honored to submit our letter entitled “Oldest-old Covid-19 patients: lessons learnt in a geriatric intermediate care unit”. We would like to share our experience about oldest-old people COVID19 patients with acute respiratory failure admitted in a geriatric intermediate care unit. Our experience among oldest old patient, not eligible for invasive mechanical ventilation, seem interesting to improve the management of such patient during SARS-CoV-2 pandemic. Indeed, non-invasive procedures

seem potentially benefit in such population with clinical success despite the severity of the COVID19 diseases with severe acute respiratory failure.

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Geneva Ethics Committee.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Authors' contributions

CC: recorded and analysed data and contribute in writing the manuscript.

TF: recorded and analysed data and contribute in writing the manuscript.

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SL: recorded and analysed data and contribute in writing the manuscript.

VT: wrote the manuscript, read and corrected the final manuscript.

FH: performed the statistical analysis, wrote the manuscript, read and corrected the final manuscript.

DZ: written the manuscript, read and corrected the final manuscript.

XR: was a major contributor in writing the manuscript, read and corrected the final manuscript.

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Declaration of Competing Interest

The authors declare that they have no competing interests.

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