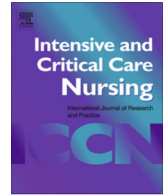




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Correspondence

Not only intensive care unit workload and activities but also quality indicators are influenced by the COVID-19 epidemic

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Dear Editor,

This retrospective case series includes adults with severe COVID-19 respiratory infection (Ruan et al., 2020; Lucchini et al., 2020) consecutively admitted in the intensive care unit (ICU) between March 14 and April 30, 2020, at a regional hospital in Hainaut Province, one pandemic epicentre in Belgium.

All COVID-19 diagnoses were confirmed through reverse-transcriptase–polymerase-chain-reaction assays performed on ICU admission (Guan et al., 2020). We compare the COVID-19 period data with two different registration periods before the COVID-19 outbreak.

Most of the data collected confirmed significant differences between the COVID-19 period and the non COVID-19 periods (Table 1) without significant differences in populations characteristics. COVID-19 patients need more and longer aggressive support like artificial ventilation and renal replacement therapy, reflected by longer ICU stay and higher SAPS 3 and SOFA scores determined on day one (Ruan et al., 2020).

The nursing workload in COVID-19 critically ill population assessed by the Nursing Activities Score (NAS) registration (Lucchini et al., 2020) not only reflects the higher workload in COVID-19 ICU but also the various complications (Guan et al., 2020; Ruan et al., 2020; Lucchini et al., 2020) developed by these critical patients.

ICU quality indicators described by the Task Force of the European Society on Intensive Care Medicine (Rhodes et al., 2012) are therefore significantly different during the COVID-19 pandemic with higher readmission rate and more adverse events principally related to ventilatory support and vascular accesses.

Nosocomial infection rate is significantly higher with more ventilator acquired infectious events (VAE) or ventilator acquired pneumonia (VAP) and catheter related infection (Central Line-associated Bloodstream Infection – CLABSI) (Klompas, 2019 Aug).

We did not observe a significantly higher absolute mortality but Standardised mortality ratio (SMR) was significantly influenced by the pandemic episode.

COVID-19 infection leads to more dramatic situations with extreme workload for the ICU teams and higher complications rate. But COVID-19 outbreak also significantly influences ICU quality indicators particularly observed incidents, in-hospital infections rates and SMR. Further studies are necessary to determine if this influence on quality indicators is related to the ICU management of this higher workload with limited resources or to the specificities of COVID-19 infection leading to more frequent complications in the most critical patients.

Ethical approval and consent to participate

Data proceeding has been approved by the ethical committee of CHR Haute Senne (Dehout F, MD, president) Approval number: 16-06-20-01.

Consent for publication

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Authors' contributions

Every authors have participated to write this publication and approved the content.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1
Comparison of activity data and quality indicators during the COVID-19 period and two previous non COVID-19 periods.

ICU periods	Covid period	Non Covid periods		P value
	2020 14 March–30 April	2019 14 March–30 April	2019/2020 14 March 2019 –13 March 2020	
New ICU admissions	31	71	549	
Bed occupancy (%)	83,5	66,5	71,6	P < 0,05
Female n (%)	11 (35,4)	28 (39,4)	201 (36,6)	NS (p < 0,01)
Age (year)	56/67/73 #	59/69/77 #	58/70/79 #	NS (p < 0,01)
ICU LOS (days)	2/6/15 #	2/3/7 #	1/3/6 #	P < 0,05
SAPS 3 score on ICU admission	46/57/63 #	36/43/59 #	36/46/60 #	P < 0,05
SOFA score on ICU day 1	1/4/7 #	0/2/5* #	0/2/5° #	*NS(p < 0,01)/°P < 0.05
ICU mortality (%)	18.8	11.8	10.7	NS (0,118)
Duration of Mechanical Ventilation (days)	2/11/24 #	1/2/9 #	1/3/8 #	P < 0,05
Use of Renal Replacement Therapy (% patients)	3 (9,4)	5 (6,6)	27 (4,9)	P < 0,05
NAS	71/87/96 #	50/59/72 #	54/65/78 #	P < 0,05
VAP (episodes/1000 days under artificial ventilation)	40,7	4,9	7,5	P < 0,05
CLABSI (episodes/1000 days with central venous catheter)	2,8	0	0	P < 0,05
ICU Readmission <48 h (%)	3.2	0	0	P < 0,05
Adverse events	22	7	79	P < 0,05
SMR	1.05	0.88	0.7	P < 0,05

Comparison of ICU patients characteristics, use of artificial ventilatory support and renal replacement therapy, NAS results, mortality and ICU quality indicators in COVID-19 patients (COVID-19 period between 14 March and 30 April 2020) with non COVID-19 patients during the same period in 2019 (14 March and 30 April 2019) and during one year (between 14 March 2019 and 13 March 2020) registration.

Data are expressed as values for centiles 25, 50 (median) and 75 or number with absolute frequency (%). # Percentiles 25/50/75.

Statistical analysis compares the COVID-19 period data with two non COVID-19 periods. For SOFA score only statistical significance is different between the two non COVID periods compared with the COVID-19 period.

LOS (length of ICU stay); SAPS score (Simplify acute physiology score); SOFA score (Sequential Organ Failure Assessment score); NAS (Nursing Activities Score); VAP (ventilator associated pneumonia); CLABSI (Central Line-associated Bloodstream Infection); SMR (Standardised mortality ratio).

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