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.

Journal of Clinical Anesthesia 67 (2020) 110028

Contents lists available at ScienceDirect

Journal of Clinical Anesthesia

journal homepage: www.elsevier.com/locate/jclinane

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Short-term outcomes of 50 patients with acute respiratory distress by COVID-19 where prone positioning was used outside the ICU

ARTICLE INFO

Keywords:
COVID-19
Prone positioning (PP)
Mild respiratory distress
Acute respiratory distress syndrome (ARDS)

To the Editor:

In December 2019, a novel coronavirus (SARS-CoV-2) causing severe acute respiratory disease emerged in the region of Wuhan, China. The clinical spectrum of patients with Corona Virus Disease 2019 (COVID-19) appears to range from asymptomatic to critical disease. The incidence of acute respiratory distress syndrome (ARDS) is high (17–30%), requiring many patients Hospital and ICU admission [1,2]. Recently, a small case series described the use of the prone positioning (PP) in awake patients with COVID-19 in the ICU [3].

We prospectively evaluated patients admitted to the Clinical University Hospital of Santiago, Spain, between March 15, 2020 and April 15, 2020, with laboratory-confirmed COVID-19 disease who had mild or moderate ARDS needing oxygen therapy [4]. We wanted to determine whether prone position would impact the oxygenation and describe treatments and short-term outcomes of these patients. Patients were instructed to remain in supine position (SP), posteriorly in PP for 30–60 min and then again in SP. The following data of all patients were collected: age, sex, height, coexisting disorders, chest radiography assessment and treatments (oxygen therapy, antibiotics, antivirals, others). StO2 and StO2/FiO2 were registered before, during and after the first PP session. Then, we recommended PP sessions for at least three times a day 30 min or until the patient becomes too tired and uncomfortable to keep that position. Follow-up was conducted at 45 days to determine how many patients were admitted in ICU, were discharge of Hospital, or were still on Hospital. The primary end point was to study if PP may improve oxygenation compared with supine position. The study protocol was approved by the ethics committee of Galicia (code No. 2020-183), and informed consent was provided by all patients. Oxygenation measures were compared among paired groups using the Wilcoxon signed rank test. P-values were penalized with the Benjamini-Yekutieli procedure. All analyses were performed in R v.3.6.

A total of 50 patients with mild or moderate ARDS by Covid-19 were included. Demographic details and treatments are summarized in Table 1. StO2/FiO2 increased during PP (277 [234–342] P: < 0.0001) and after PP (277 [237–345] P: < 0.0001) compared with previous supine position (265 [233–342]). StO2 increased during PP (95 [95–96] P: < 0.0001) and following PP (96.5 [94.2–98] P: < 0.0001) compared with previous SP (94 [92–95]). During and following PP, 40 patients (80%) and 37 patients (74%) had an increase of StO2/FiO2, respectively. After a follow-up o 45 days, 2 (4%) patients died, 7 (14%) patients needed ICU admission and 41(82%) patients were discharged from the Hospital.

In the present investigation we observed that PP was associated with significant increase in oxygenation (StO2/FiO2) in hospitalized non-ICU patients with ARDS by COVID-19. In theory, many of the mechanisms that explain an improvement of oxygenation in ventilated patients could be applied to awake patients with different levels of ARDS. PP reduces lung ventilation/perfusion mismatch, promotes recruitment of non-aerated dorsal lung regions of the lung, and distributes transpulmonary pressure along the ventral-to-dorsal axis more homogeneously compared with supine position [4]. PP may be possible, economic, and simple strategy to improve oxygenation in hospitalized non-ICU patients with ARDS by COVID-19 needing oxygen therapy and may decrease the need of ICU admissions.

Limitations to this study included: First, our study does not allow determining the best duration and frequency of PP, however longer time of PP may even more improve oxygenation similarly to ventilated patients with severe ARDS [4]. Second, the small sample size does not permit the evaluation of the effect of PP on the need of an ICU admission, mechanical ventilation, or mortality.

Summary statement

In hospitalized non-ICU patients with mild or moderate ARDS by COVID-19 needing therapy with oxygen, prone positioning improves oxygenation.

CRediT authorship contribution statement

1. Conception of the study: Manuel Taboada, Nuria Rodríguez.
2. Study design: Manuel Taboada, Aurora Baluja.
3. Data collection: Manuel Taboada, Nuria Rodríguez, Vanessa Riveiro.
4. Data análisis: Aurora Baluja.
5. Drafting the manuscript: All authors helped to revise the draft of the manuscript.
6. Editing and approval of the manuscript: All authors.

https://doi.org/10.1016/j.jclinane.2020.110028
Received 4 June 2020; Received in revised form 25 July 2020; Accepted 15 August 2020
Available online 18 August 2020
0952-8180/

Table 1
Demographics data, coexisting conditions, radiological and laboratory findings of the study patients.

Clinical characteristics of the patients	
Demographics	Patients (29)
Age, mean ± SD, year	63 [53–71]
Female sex, n (%)	14 (28%)
BMI, mean ± SD, cm	29 [27–32]
Coexisting conditions, n (%)	
Hypertension	28 (56%)
Hyperlipidemia	24 (48%)
Diabetes	5 (10%)
Chronic obstructive pulmonary disease	6 (12%)
Others	7 (14%)
Radiological findings, n (%)	48 (96%)
Local patchy shadowing	8 (16%)
Bilateral patchy shadowing	32 (64%)
Interstitial abnormalities	6 (21%)
Laboratory parameters, median (IQR)	
Leukocytes	7020 [5455–8600]
Lymphocytes	1025 [727–1510]
C-reactive protein, mg/L	6 [3 – 13]
D-dimer, ng/mL	681 [472–1126]
Lactate dehydrogenase, U/L	463 [339–580]
Creatine kinase, ng/mL	53 [38–102]
Serum ferritin, μg/L	632 [400–1453]
Interleukin-6, pg/mL	19 [7–35]
PCT ≥ 0.05 ng/mL, No. (%)	3/29 (10%)
Triglycerides	169 [122–217]
Time from illness onset to hospital admission, days	8 [5–11]
Length of hospital stay, days	13 [10–18]
Patients needing ICU admission	7 (14%)
Length of ICU stay, days	11 [9–14]
Medical treatments	
Lopinavir-ritonavir	44 (88%)
Hydroxychloroquine	50 (100%)
Azithromycin	49 (98%)
Tocilizumab	14 (28%)
Corticosteroids	28 (56%)
Anticoagulant prophylactic dose	50 (100%)

Data presented as number (%), or median (IQR).
BMI = body mass index.

Clinical trial number

Code No. 2020-183.

Prior presentations

No.

Funding statement

No funding provided.

Support

Support was provided solely from institutional and departmental sources.

Declaration of competing interest

The authors declare the absence of conflict of interests.

Acknowledgments

The authors thank all physicians and nurses of the Hospital Clínico Universitario Santiago de Compostela, Spain.

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