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CORRESPONDENCE

Tolerability of prone positioning in non-intubated patients with hypoxaemia due to COVID-19-related pneumonia

To the Editors:

Coronavirus disease 2019 (COVID-19) may result in acute respiratory distress syndrome.[1] Prone positioning (PP) has been reported to improve the clinical condition of patients with COVID-19,[2–4] and has often been performed on non-intubated patients with COVID-19-related pneumonia. PP may be one of the effective treatments for COVID-19, especially in regions with limited medical resources. The ability of the patient to tolerate PP is important; however, few studies have examined this topic in detail. This study aimed to assess the tolerability of PP in non-intubated patients with hypoxaemia due to COVID-19-related pneumonia.

This single-centre, prospective study enrolled 20 patients who were asked to perform PP intermittently or continuously at least 3 h per day for five consecutive days. Patients were included if they were older than 20 years of age, diagnosed with COVID-19-related pneumonia with a consistent capillary oxygen saturation of ≤93% and provided written informed consent. Patients were excluded if they had haemodynamic instability, were pregnant or lactating, had a history of surgery or trauma or had pneumothorax. The patients self-recorded the duration of PP in 30-min increments, and an interruption was defined as discontinuation of more than 5 min. The use of pillows and/or cushions for pain relief was permitted. The patients answered a questionnaire about adverse effects at the end of day 5. The primary outcome was tolerability of PP after 5 days, which was defined as the ability to completely perform PP. Categorical data were described as numbers and percentages, while continuous data were described as the median along with range, or as the mean along with SD, unless otherwise indicated. Data analyses were performed using R Statistical Software (v4.1.2; R Core Team 2021).

The study was performed between June 2021 and October 2021. Results are summarized in Table 1. Twelve patients (63.2%) were male, and the median age of the sample was 56.0 years (range: 25–71). The median BMI was 23.7 (range: 14.8–32.5).

Nineteen patients were prescribed PP, of whom 16 (84.2%, 95% CI: 0.604–0.966) completely performed the positioning, and 13 answered that they could continue doing so. The average daily duration of PP was 214.1 min. Four patients received oxygen via high-flow nasal cannula, and one

TABLE 1 Summary of patient characteristics

Variables		
Sex	Male/female, *n* (%)	12/7 (63.2/36.8)
Age, years	Median (range), years	56.0 (25–71)
BMI	Median (range)	23.7 (14.8–32.5)
	≧30	2 (10.5)
Smoking status	Never/ex- or current, *n* (%)	8/11 (42.1/57.9)
Vaccine	With/without, *n* (%)	4/15 (21.1/78.9)
Medications	Remdesivir, *n* (%)	19 (100)
	Dexamethasone, *n* (%)	12 (63.2)
	Baricitinib, *n* (%)	5 (26.3)
	Tocilizumab, *n* (%)	4 (21.1)
	Anticoagulant therapy, *n* (%)	9 (47.4)
	Others, *n* (%)	1 (5.3)
Prone positioning	Performed completely, *n* (%)	16 (84.2)
	Possible to continue to perform, *n* (%)	13 (68.4)
	Mean daily duration (range), min	214.1 ± 92.5 (78.0–444.0)
Effectiveness	Mean duration of oxygen therapy (range), days	4.8 ± 4.5 (1–15)
	Intubation rate at day 28 (%)	0
	Mortality at day 28 (%)	0
Adverse events	Any, *n* (%)	16 (84.2)
	Backache, *n* (%)	7 (36.8)
	Liver dysfunction, *n* (%)	7 (36.8)
	Stiff shoulders, *n* (%)	6 (31.6)
	Neck pain, *n* (%)	5 (26.3)
	Headache, *n* (%)	2 (10.5)
	Loss of appetite, *n* (%)	2 (10.5)
	Food reflux, *n* (%)	2 (10.5)
	Diarrhoea, *n* (%)	2 (10.5)
	Constipation, *n* (%)	2 (10.5)
	Numbness, *n* (%)	2 (10.5)
	Malaise, *n* (%)	2 (10.5)

patient required mechanical ventilation. However, all patients were free of oxygen therapy and alive at day 28. The mean duration of supplemental oxygen therapy was 4.8 ± 4.5 days (range: 1–15). No serious adverse events were observed.

Patient cooperation and proper care for them are required to perform PP for longer periods of time. In our study, a higher completion rate was noted, which indicates that PP was not so painful for the participants. Further care such as adjustment of the bed mattress, prophylactic medications and encouragement may be considered for furthering completion rates.

In summary, PP in non-intubated patients with hypoxaemia due to COVID-19-related pneumonia was tolerable. Studies involving multiple centres and randomization with larger numbers of cases should be considered to strengthen the evidence.

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CONFLICT OF INTEREST

Go Saito reports receiving personal fees from AstraZeneca Kk, Ono Pharmaceutical Co. Ltd., Taiho Pharmaceutical Co. Ltd., Chugai Pharmaceutical Co. Ltd. and Novartis Pharma Kk outside the submitted work.

DATA AVAILABILITY STATEMENT

Derived data supporting the findings of this study are available from the corresponding author on request.

HUMAN ETHICS APPROVAL DECLARATION

This study was approved by the institutional review board of Chiba University Hospital (identifier: G2021003) and informed consent was obtained from all individual participants in the study. Clinical trial registration: UMIN000044567 at https://rctportal.niph.go.jp

Kohei Shikano MD[1]
Seiichiro Sakao MD, PhD[1]
Yosuke Inaba PhD[2]
Toshibumi Taniguchi MD, PhD[3]
Go Saito MD[1]
Akira Naito MD, PhD[1]
Mitsuhiro Abe MD, PhD[1]
Hajime Kasai MD, PhD[1]
Misuzu Yahaba MD, PhD[3]
Takeshi Kawasaki MD, PhD[1]
Ayako Shigeta MD, PhD[1]
Jun Ikari MD, PhD[1]
Toshihiko Sugiura MD, PhD[1]
Yohei Kawasaki PhD[2,4]
Hidetoshi Igari MD, PhD[3]
Takuji Suzuki MD, PhD[1]

[1]*Department of Respirology, Graduate School of Medicine, Chiba University, Chiba, Japan*
[2]*Biostatistics Section, Clinical Research Center, Chiba University Hospital, Chiba, Japan*
[3]*Department of Infectious Diseases, Chiba University Hospital, Chiba, Japan*
[4]*Faculty of Nursing, Japanese Red Cross College of Nursing, Tokyo, Japan*

Correspondence
Seiichiro Sakao
Email: sakaos@faculty.chiba-u.jp

Handling Editors: Philip Bardin and Paul Reynolds

ORCID

Kohei Shikano https://orcid.org/0000-0001-8781-2367
Seiichiro Sakao https://orcid.org/0000-0001-6719-1022
Yosuke Inaba https://orcid.org/0000-0002-8659-2873
Toshibumi Taniguchi https://orcid.org/0000-0002-7732-9870
Go Saito https://orcid.org/0000-0002-7875-6399
Akira Naito https://orcid.org/0000-0002-6487-4845
Mitsuhiro Abe https://orcid.org/0000-0001-9084-3180
Hajime Kasai https://orcid.org/0000-0002-6759-2026
Misuzu Yahaba https://orcid.org/0000-0003-2004-6930
Takeshi Kawasaki https://orcid.org/0000-0002-1468-172X
Ayako Shigeta https://orcid.org/0000-0002-4536-4487
Jun Ikari https://orcid.org/0000-0001-7750-4328
Toshihiko Sugiura https://orcid.org/0000-0003-4394-6229
Yohei Kawasaki https://orcid.org/0000-0002-7474-7647
Hidetoshi Igari https://orcid.org/0000-0001-7754-3458

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