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ORIGINAL RESEARCH

Perception of health professionals on the prone position as a therapeutic strategy for patients with COVID-19

Percepção de profissionais de saúde sobre a posição prona como estratégia terapêutica para pacientes com covid-19

Percepción de los profesionales de la salud sobre la posición prono como estrategia terapéutica para pacientes con Covid-19

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ABSTRACT | The COVID-19 pandemic has led to a great number of hospitalizations. A considerable number of cases progress to the severe form of the infection and death. Prone positioning is a therapeutic strategy with strong evidence of reduced mortality in patients with acute respiratory distress syndrome (ARDS). This study aims to assess if the prone positioning strategy is used by health professionals in hospitals to treat patients with COVID-19 on invasive mechanical ventilation and the professionals' perception of its effect on the mortality rate. This is a cross-sectional study, with a convenience sample composed of health professionals of both sexes working in hospitals throughout Brazil. Participants answered an online questionnaire composed of 16 questions using Google Forms, from July 2020 to September 2020. A total of 455 questionnaires were answered. Prone positioning is routinely performed in hospitals where 386 (95%) of the responding professionals work. Among them, 374 (96.9%) consider that the prone position strategy reduces hypoxemia and 289 (74.9%) consider that it reduces mortality in patients with COVID-19 and ARDS on invasive mechanical ventilation. Finally, most health professionals working in Brazilian hospitals perform and believe that prone positioning reduces hypoxemia and mortality in patients with COVID-19 on invasive mechanical ventilation.
Keywords | Coronavirus Infections; Prone Position; Mortality; Hypoxia; Observational Study.

RESUMO | A pandemia de covid-19 gerou um grande número de internações hospitalares e uma quantidade considerável de casos evolui para a forma grave da doença e óbito. A manobra de posição prona é uma estratégia terapêutica com forte evidência de redução da mortalidade em pacientes com síndrome do desconforto respiratório agudo (SDRA). Este estudo teve como objetivo verificar se a manobra de decúbito ventral é realizada como estratégia de tratamento de pacientes com covid-19 em ventilação

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mecânica invasiva por profissionais de saúde que atuam em ambiente hospitalar e a percepção sobre seu impacto na mortalidade. Trata-se de um estudo transversal, com amostra de conveniência composta por profissionais de saúde que atuam em hospitais de todo o Brasil, de ambos os sexos. Os participantes responderam a um questionário online, composto por 16 questões, elaborado no Google Forms, de julho a setembro de 2020. Quatrocentos e cinquenta e cinco questionários foram respondidos. A manobra da posição prona é realizada rotineiramente em hospitais onde atuam 386 profissionais (95%). Desses, 374 (96,9%) têm a percepção de que a manobra de decúbito ventral reduz a hipoxemia e 289 (74,9%) percebe que ela reduz a mortalidade de pacientes com covid-19 e SDRA em ventilação mecânica invasiva. Em conclusão, a maioria dos profissionais de saúde que atuam em hospitais brasileiros realiza e acredita que a manobra de decúbito ventral reduz a hipoxemia e a mortalidade em pacientes com covid-19 em ventilação mecânica invasiva.
Descritores | Infecções por Coronavírus; Posição Prona; Mortalidade; Hipóxia; Estudo Observacional.

RESUMEN | La pandemia del Covid-19 ha generado un incremento de las hospitalizaciones y un gran número de casos de esta enfermedad ha evolucionado a su forma grave y la muerte. El manejo de la posición de decúbito prono es una estrategia terapéutica con sólida evidencia de reducción de la mortalidad en pacientes con síndrome de dificultad respiratoria aguda (SDRA). Este estudio tuvo como objetivo comprobar si la posición de decúbito prono es realizada por los profesionales de la salud que trabajan en un hospital como estrategia para el tratamiento de pacientes con el Covid-19 en ventilación mecánica invasiva y la percepción de estos profesionales sobre el impacto de tal práctica en la mortalidad. Se trata de un estudio transversal, con una muestra de conveniencia compuesta por profesionales de la salud que actúan en hospitales de todo Brasil, de ambos sexos. Los participantes respondieron un cuestionario en línea, con 16 preguntas en Google Forms, en el periodo de julio a septiembre de 2020. Se respondieron 455 cuestionarios. El manejo de la posición de decúbito prono se realiza de forma rutinaria en los hospitales donde trabajan 386 profesionales (95%). De estos, 374 (96,9%) tienen la percepción de que el manejo de la posición de decúbito prono reduce la hipoxemia y 289 (74,9%) perciben que esta práctica reduce la mortalidad de los pacientes con Covid-19 y SDRA en ventilación mecánica invasiva. Se concluye que la mayoría de los profesionales de la salud que actúan en los hospitales brasileños realizan y creen que la posición de decúbito prono reduce la hipoxemia y la mortalidad en pacientes con Covid-19 en ventilación mecánica invasiva.
Palabras clave | Infecciones por Coronavirus; Posición Prona; Mortalidad; Hipoxia; Estudio Observacional.

INTRODUCTION

The new coronavirus, SASR-CoV-2, has created a worldwide scenario of public calamity, with a great number of hospitalizations and deaths[1]. Most patients with COVID-19 are asymptomatic or present mild symptoms. However, a considerable number of cases progress to the severe form of the infection. In this condition, patients present severe hypoxemic respiratory failure and a clinical picture similar to acute respiratory distress syndrome (ARDS). This condition is characterized by severe progressive hypoxemia[2] and the main strategy used to manage it is ventilatory support[3,4].

Besides protective ventilatory support, prone positioning is a therapeutic option that has had beneficial effects on refractory hypoxemia[5,6]. In the prone position, body areas are uniformly ventilated and the ventilation-perfusion ratio improves[6]. A previous study showed that a minimum of 16 hours in the prone position reduced mortality in patients with severe ARDS[7]. Thus, patients with COVID-19 could benefit from this therapeutic approach.

Due to the current scenario of social isolation, research involving personal contact is limited, so the use of technological strategies is required. In this sense, the development of online questionnaires has helped researchers from different areas to search for answers and solutions related to COVID-19. So far, there is no evidence of the extensive use of prone positioning in the treatment of patients with COVID-19 or moderate or severe ARDS, or to prove if it has beneficial effects or any influence over time regarding mechanical ventilation, length of hospital stay, and mortality. Therefore, this study aims to assess if the prone positioning strategy is performed by Brazilian health professionals in the treatment of patients with COVID-19 on invasive mechanical ventilation and the professionals' perception of its effects on mortality.

METHODOLOGY

This is an observational, cross-sectional online study performed with a convenience sample composed of health

professionals of both sexes and all ethnicities working in Brazilian hospitals, regardless of whether they are acting directly on COVID-19 cases or not. Responses from professionals who did not work in hospitals were excluded. Data were collected from July 2020 to September 2020 via an online questionnaire. The link to disclosure and participate in the study was shared on social networks. To participate in the study, participants signed an informed consent form available on the link sent with the questionnaire.

A structured questionnaire with 16 questions was used for data collection (Supplementary Material 1). The objective questions related to the assessed outcomes were about: (1) the use of prone positioning in hospitals as a therapeutic strategy for critically ill patients and patients diagnosed with COVID-19 or moderate or severe ARDS; (2) the training of healthcare teams to perform prone positioning; (3) the health professionals' perception of the effect of prone positioning on hypoxemia and mortality in patients with COVID-19 on invasive mechanical ventilation; (4) the professionals' perception of outcomes assessment after performing prone positioning (e.g., ventilation and blood gas analysis, time of mechanical ventilation and length of hospital stay, and mortality); (5) the health professionals' perception of the barriers or limitations for performing prone positioning.

A few open-ended questions were designed so that the participants could mention conditions that were not foreseen by the researchers. Data were analyzed using Microsoft Office Excel 2011 and presented descriptively in absolute numbers and frequencies.

RESULTS

A total of 455 questionnaires were answered. As they were shared on social networks, we could not calculate the rate of return. Among the professionals who answered, 429 (94.3%) were physical therapists, 10 (2.2%) were physicians, eight (1.8%) were nurses, six (1.3%) were licensed practical nurses, one (0.2%) was a biomedical physician, and one (0.2%) was a nutritionist. Diplomas ranged from technical education to doctoral degrees. In total, 49 (10.8%) participants did not work in hospitals, thus, they were excluded from the study. Of the 406 professionals who worked in hospitals, 366 (90.2%) worked as caregivers, 29 (7.2%) performed administrative or coordination functions, four (1%) performed more than one function, and one (0.2%) had another function. Concerning the country region, 159 (39.2%) worked in the Southeast Brazil, 110 (27.1%) in the Southern Brazil, 90 (22.2%) in the Northeast Brazil, 31 (7.6%) in the Midwest Brazil, and 16 (3.9%) in the Northern Brazil.

The prone positioning strategy is performed routinely in hospitals where 386 (95%) of the professionals work. Among them, 296 (76.7%) reported the team was trained to perform the strategy. Of the 20 (5%) professionals who answered that this strategy is not performed where they work, 16 (80%) believed that it should be implemented. Prone positioning is performed in hospitals where 383 professionals work, as a therapeutic strategy for patients diagnosed with COVID-19 and moderate or severe ARDS. Three professionals reported the strategy was not performed in patients with COVID-19 in the hospital where they work, but they considered that it should be implemented.

Among the 383 participants whose workplace performed prone positioning in patients with COVID-19, most of them had the perception that the strategy reduces hypoxemia and mortality in patients with COVID-19 on invasive mechanical ventilation. However, part of them did not have an opinion on this issue. Figure 1 shows the precise proportion of opinions regarding hypoxemia and mortality outcomes.

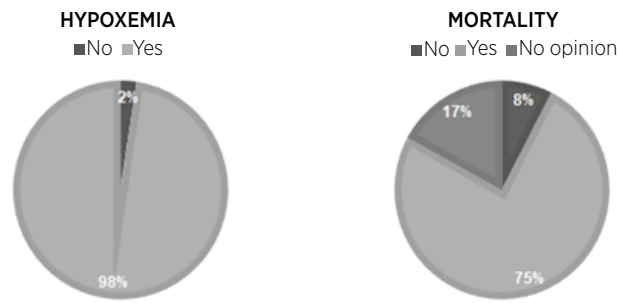

Figure 1. Percentual of health professionals responders who have the perception that the prone position maneuver reduces or not hypoxemia and mortality

Regarding the efficacy of the strategy, hospitals where 349 (91.1%) professionals work assess ventilatory parameters; hospitals where 363 (94.8%) professionals work assess blood gas parameters; hospitals where 146 (38.1%) professionals work assess mortality; hospitals where 180 (46.9%) professionals work assess the invasive mechanical ventilation time, and hospitals where 140 (36.5%) professionals work assess the length of hospital stay.

As barriers or limitations to perform prone positioning, of the 406 professionals who worked in hospitals, 215 (52.9%) considered the heavy workload a difficulty factor, 163 (40.1%) mentioned the lack of trained personnel, 129 (31.7%) mentioned the lack of

protocols and/or guidelines, 118 (29.1%) mentioned the lack of personnel to perform prone positioning, 66 (16.2%) mentioned the lack of material, and 40 (9.8%) reported other barriers.

DISCUSSION

This study analyzed the perception of health professionals working in Brazilian hospitals regarding the effects of prone positioning in patients with COVID-19 on invasive mechanical ventilation. Most professionals perform this strategy in the hospitals where they work and perceive that it reduces hypoxemia and mortality in patients. This perception, based on clinical practice, may be correct since patients with severe COVID-19 present a similar clinical picture to patients with ARDS. It can also be influenced by prior experiences the health professionals had using the strategy in different health emergencies that required their knowledge. On the other hand, 16.8% of the participants answered that they did not have an opinion about the effect of prone positioning on mortality, which is probably related to the lack of strong evidence assessing these outcomes in patients with COVID-19. Actually, only an observational study with a large sample of patients or, in the best of cases, a randomized clinical trial could prove the perception of the respondents of this study.

Prone positioning, performed for at least 12 hours, improves hypoxemia and reduces mortality in patients with ARDS[5,7]. Until now, studies that actively used prone positioning in patients with COVID-19—who did not require orotracheal intubation— have been developed and state that the practice is safe[8,9], presenting benefits for oxygenation when performed for at least three hours[10]. Considering the available literature, prone positioning seems to be a beneficial strategy to manage patients with COVID-19[11]. However, clinical studies that assess the effectiveness of this therapeutic strategy in patients with COVID-19 presenting a severe disease profile, similar to what is observed in patients with ARDS, is still necessary.

In Brazil, we did not find any data regarding the use and effects of prone positioning on critically ill patients with COVID-19, so that is the reason why our study is relevant. In the United States, of 24 confirmed cases of COVID-19, 28% of the patients with severe infection were subjected to prone positioning[12]. In Italy, this percentage was 27% of 875 patients[13]. In Wuhan, China, a study with 710 patients infected with SARS-CoV-2 observed that 11.5% of those who received ventilation (invasive or non-invasive) also were subjected to this strategy[14].

Despite being strongly recommended for patients with ARDS, prone positioning is still little used in the management of patients with COVID-19, and this is probably due to the difficulty of implementing it in clinical practice[15]. Most participants in this study considered the high workload and lack of trained personnel as obstacles to carry out prone positioning. In this sense, hospital service managers need to analyze the working conditions of the teams, as well as the attention to the continuing training of professionals, enabling them to act on the front lines to tackle COVID-19 pandemic.

The main outcomes assessed after prone positioning were ventilatory and blood gas parameters. They can be easily collected in hospitals and are easily measured at the bedside—which is why they are the most used for immediate measurement of the benefit of prone positioning. Less than 40% of the professionals reported the assessment of mortality and length of hospital stay in their workplace. The evaluation of these outcomes is important and assists decision-making on the broad implementation of this strategy, if it presents positive results (these outcomes directly influence hospital costs.)

Among the study limitations, the questionnaire did not undergo a peer review before its publication and the number of Brazilian hospitals involved in the study is unknown. Due to ethical issues, collecting this information using electronic questionnaires was not feasible. Moreover, the sample was predominantly composed of physical therapists (94.3%), which means that professionals from other health areas may have a different perception of the effectiveness of prone positioning. Despite this, physical therapists were evenly distributed, according to the number of these professionals by Brazilian regions. It corroborates the survey of registered physical therapists by region carried out in a previous study[16], which shows the representativeness throughout Brazil.

CONCLUSION

Most health professionals who work in Brazilian hospitals perform the prone positioning strategy in patients with COVID-19 on invasive mechanical ventilation and perceive that this therapeutic approach reduces hypoxemia and mortality in this population. Prone positioning seems to be an effective strategy to reduce mortality in patients with COVID-19 on invasive mechanical ventilation.

However, cohort studies and randomized clinical trials are necessary in order to confirm this hypothesis.

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