ORIGINAL ARTICLE

DOI: 10.4274/eamr.galenos.2022.36693
Eur Arch Med Res 2023;39(1):13-19

OPEN ACCESS

Pressure Ulcers in COVID-19 Patients in the Intensive Care Unit

Esra Akdaş Tekin[1], Hakan Küçükkepeci[1], Sinan Mutlu[1], Fethi Gültop[1], Hüseyin Sevgi[2], Necla Köse[2], Namigar Turgut[1]

[1]University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu City Hospital, Clinic of Anesthesiology and Reanimation, İstanbul, Turkey
[2]University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu City Hospital, Clinic of Intensive Care, İstanbul, Turkey

Abstract

Objective: Pressure ulcer (PU) in Coronavirus disease-2019 (COVID-19) patients will be an important health and cost factor for all countries. Risk factors for the development of PU in patients admitted to intensive care unit (ICU) during the COVID-19 pandemic were evaluated in terms of treatment and outcomes.

Methods: Patients were divided into two groups (group I= developing PU, group II= did not develop PU).

Results: A total of 105 patients were included in the study. PU developed in 20 patients (19%). The mean age was 58.45±13.35, days of PU development was 6. The duration of uninterrupted prone positioning was 23.55±4.38 hours among the study patients. The duration of ICU stay and mechanical ventilation duration of group I cases were longer than the durations of group II cases. There was no significant difference between the groups in terms of gender percentages, age, albumin, hemoglobin and C-reactive protein values ($p>0.05$).

Conclusion: Prolonged prone position are independent risk factors for the development of PU in COVID-19 patients.

Keywords: Pressure ulcers, prone position, COVID-19

INTRODUCTION

Pressure ulcers (PU) can occur in any area of the body that is subjected to pressure. Pain, length of intensive care unit (ICU) stay, diabetes, time of MAP <60-70 mmHg, length of mechanical ventilation (MV), haemodialysis or CRRT, vasopressor support, sedation, decreased consciousness level, hypoalbuminemia, anemia, malnutrition, obesity, dehydration, smoking, advanced age, excessive humidity are known risk factors for PU (1,2).

Severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) was identified in China in December 2019 and became a pandemic in a short period of time (3). In Coronavirus disease-2019 (COVID-19) cases, pneumonia caused by the SARS-CoV-2 may be decompensated due to hypoxemia respiratory failure compatible with acute respiratory distress syndrome (ARDS) (4). In patients with ARDS, the need for the prone position (PP) is increasing gradually as it allows gathering dorsal lung regions, increased end expiratory lung volume, and reduced alveolar shunt (4,5). It has been known for many years that in patients with moderate and severe ARDS, PP for 12 hours or longer together with lung protective ventilation improves the PaO_2/FiO_2 ratio and leads to lower mortality (6,7). However, prone positioning has been associated with higher rates of PU (6). It is clear that PU will be an important health and cost factor for all countries, despite the positive effect of PP on survival during the pandemic.

In this study, the risk factors for the development of PU in patients with ARDS who were admitted to the ICU of the study hospital during the COVID-19 pandemic were evaluated in terms of treatment and results.

Address for Correspondence: Namigar Turgut, University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu City Hospital, Clinic of Intensive Care, İstanbul, Turkey
Phone: +90 212 221 77 77 **E-mail:** namigarturgut@gmail.com **ORCID ID:** orcid.org/0000-0003-0252-3377

Cite this article as: Akdaş Tekin E, Küçükkepeci H, Mutlu S, Gültop F, Sevgi H, Köse N, Turgut N. Pressure Ulcers in COVID-19 Patients in the Intensive Care Unit. Eur Arch Med Res 2023;39(1):13-19

Received: 17.05.2022
Accepted: 25.07.2022

©Copyright 2023 by the University of Health Sciences Turkey, Prof. Dr. Cemil Taşcıoğlu City Hospital
European Archives of Medical Research published by Galenos Publishing House.

METHODS

Ethical Considerations

In the study, the patients who developed PU due to PP between patients who were admitted to the COVID-19 ICU between March 1, 2021 and May 31, 2021 were analyzed retrospectively with the approval of University of University of Health Sciences Turkey, Prof. Dr. Cemil Tascioglu City Hospital Local Ethics Committee (date: 24.05.2021, protocol number: 213) and was conducted in accordance with the Helsinki Declaration.

Study Design and Patient Selection

Written informed consent was obtained from the patients for their anonymized information to be published in this article. Patients over the age of 18 who stayed in ICU for more than 48 hours were included in the study, and those under the age of 18 were excluded from the study.

Patients were divided into two groups (group I= developing PU, and group II= did not develop PU). Demographic data, duration of the ICU stay, time in PP, comorbid conditions, days with PU, duration with MV, albumin (Alb) level (reference range 3.5-5.2 g/dL), the hemoglobin (Hb) level (reference range 12-16 g/L), and C-reactive protein (CRP) (mg/L, reference range 0-5 mg/L) level were analyzed. The approach to PU and wound infection were examined.

Definitions

PU risk scale: Braden scale is the most widely employed risk assessment tool. It is considered the gold standard PU risk assessment scales (8).

Statistical Analysis

All the statistical analyses were performed in the 1.15.3 program [R Core Team (2017) R Faundation for Statistical Computing, Vienna, Austria]. Minimum, maximum, mean, standard deviation, median, first quartile, third quartile, frequency, and percentage were used in reporting study data. The conformity of the quantitative data to the normal distribution was evaluated with the Shapiro-Wilk test and graphical examinations. Independent groups t-test was used for the evaluation of the normally distributed variables between two groups. The Mann-Whitney U test was used for the evaluation of the non-normally distributed variables between two groups. Chi-square test was used for comparison of qualitative data and the Pearson correlation test was used to evaluate the association between certain variables. Significance was assessed at $p<0.05$ level.

RESULTS

A total of 105 patients with moderate to severe COVID-19 ARDS were admitted to the COVID-19 ICU during the three-month period. All of the patients were under invasive MV support and they received enteral and parenteral nutrition and sedoanalgesia. PU developed in 20 patients in the follow-ups performed using the Braden PU risk assessment scale. In group I (n=20), the mean age was 58.45±13.35 and 11 were men (55%) while 9 patients were women (45%). In group II (n=85) the mean age was 62.58±15.31, 43 patients were female and 42 patients were male.

The incidence of PU (number of PU developing in the ICU/total number of days of hospitalization in the ICU x100) was 19%. It was found that the day of PU development was 6/days following the hospitalization, the durations of hospitalized in the ICU was 15.05/days, and the mean duration of MV was 12.15/days.

In group I, the duration of ICU hospitalization was 13.5/day, and the mean duration of MV was 11.5/day. In group II, the duration of ICU hospitalization was 6/day, and the mean duration of MV was 0 (0, 16) day.

It was determined that the duration of ICU stay and MV of group I cases were longer than the durations of group II cases (p=0.009, p=0.002, respectively).

The duration of uninterrupted prone positioning was 23.55±4.38 hours among the study patients. The patients were positioned prone for an average of 5.75 times (2-12) and at least 16 hours during the care unit stay. In group II, it was under 12 hours.

There was no significant difference between the groups in terms of Alb, Hb and CRP values ($p>0.05$) (Table 1).

While there was no comorbid condition in 5 patients in group I (25%), hypertension + diabetes mellitus (HT+DM) (25%) in 5 patients, DM in 4 patients (20%), HT in 3 patients (15%) were observed. In group II patients, there was no comorbid condition in 13 patients (15.29%); however, DM+HT in 13 patients (15.29%), DM in 22 patients (25.88%), HT in 20 patients (23.52%), asthma bronsiale (5.8%) in 5 patients, and COPD (5.8%) in 5 patients were observed.

While 2° and necrotic PU occurred in 7 patients in group I, the main areas were forehead and nose in all patients. *Klebsiella* was observed in the trachea culture of 3 patients with PU, Carbapenem resistant *Klebsiella* + *Enterococcus* was observed in one patient, *Klebsiella* + *Candida* was observed in blood culture of one patient. One patient had *Candida*.

Forehead (80%), thorax and anterior abdomen (40%), nose (25%), knee (25%) were the most common areas of PU development (Table 2), (Figures 1, 2). The approach to PS in patients was the application of wet dressing (stage I-II, Figure 3).

DISCUSSION

During the COVID-19 pandemic, a disproportionate level of prone ventilation was required to improve prognosis in patients with respiratory distress compared to the general intensive care population. However, making patients prone leads to important complications such as PU (8-10).

Metaanalyses of randomized controlled trials showed that survival increased when patients with severe ARDS (PaO_2/FIO_2 <150mm Hg) were treated with lower tidal volume (≤8 mL/kg), higher PEEP (10-13 cm H_2O), and longer PP duration (>0-12 hours/session) (11). Intubated patients may stay in PP for up to 12-16 hours (12). In COVID-19 ICU, few complications were observed when the PP duration of 8±5 hours in the first 24 hours was continued for an average of 10±5 days, and the conscious use of PP was emphasized (13). It has been suggested that hypoxemia, microvascular injury, and thrombosis may increase the risk of PU in COVID-19 pneumonia. Hypoxemia results in a decrease in peripheral perfusion, including skin perfusion, and this leads to the developments of ischemic skin lesions. Anatomopathological analyses of purpuric skin lesions also showed the presence of pauci-inflammatory thrombogenic vasculopathies (14). In the present study, the uninterrupted duration in the PP was 24 hours/session (16-32). Although all patients were placed in the left and right PP every 6 hours, PU developed. These patients required continued prone positioning to improve respiratory mechanics and oxygenation due to increased hypoxemia.

As the PP needs to be maintained for 10 to 12 hours to become effective, prolonged pressure may cause potential ischemic lesions at pressure points on the face. These facial ulcers most often occur around bony structures, including the forehead, cheekbones, and chin (2,4).

The face was shown as the most affected area (69%) in patients who developed PU due to the PPn. The most common stage II ulcer was observed (9). In our study, the forehead (80%) and thorax and anterior abdomen (40%) were the most common areas of PU in our patients. Stage II ulcers were detected in 35% of the cases.

Five potential causes have been identified that may have contributed to the increase in pressure-related tissue damage in COVID-19 patients. Physiological changes were associated with COVID-19 due to increased use of medical devices needed to support therapy (nasal cannulas, oxygen masks, high-flow oxygen devices, chest drains, tracheostomy tubes, endotracheal tubes, bi-level positive airway pressure or continuous positive air tract pressure masks, malnutrition, reduced mobility, and labor difficulties (15).

In addition to long-term invasive MV and immobility required for PP, friction/shear, use of vasopressors such as norepinephrine, advanced age, anemia, low risk scale score, fecal and urinary incontinence, dehydrated skin, and the presence of chronic diseases are additional risk factors (8,13,16,17). MV longer than 72 hours has been associated with a 23-fold higher risk of developing PU (6). Long-term invasive MV was applied to all of the patients [group I, 12.15 (6-23)/day; group II, 12.09 (2-108)/day]. However, PU developed in 20 patients (19%). Maintaining PP for more than 16 hours was the common point of the patients

Table 1. Demographic and clinical characteristics of patients

	Group I (n=20)	Group II (n=85)	p
Gender n (%)			[a]**0.804**
Male	11 (55)	42 (49.4)	
Female	9 (45)	43 (50.6)	
Age (years) mean ± SD	58.45±13.35	62.58±15.31	[b]**0.270**
Length of ICU stay (days), median (Q1, Q3)	13.5 (10, 18)	6 (2, 19)	[c]**0.009***
MV (days), median (Q1, Q3)	11.5 (6.5, 16.5)	0 (0, 16)	[c]**0.002***
Pressure ulcer (day) median (Q1, Q3)	6 (3.5, 8.5)	-	
Time in prone position (hours) mean ± SD	23.55±4.38	-	
Albumin (g/dL) mean ± SD	2.75±0.74	2.86±0.70	[b]**0.524**
Hemoglobin (g/L) mean ± SD	11.33±2.16	10.99±2.08	[b]**0.525**
CRP (mg/L) median (Q1, Q3)	45.4 (14.8, 114)	42.4 (13, 132.1)	[c]**0.948**

[a]Pearson chi-square test test, [b]Independent groups t-test, [c]Mann-Whitney U test, *p<0.05, SD: Standard deviation, ICU: Intensive care unit, CRP: C-reactive protein, MV: Mechanical ventilation

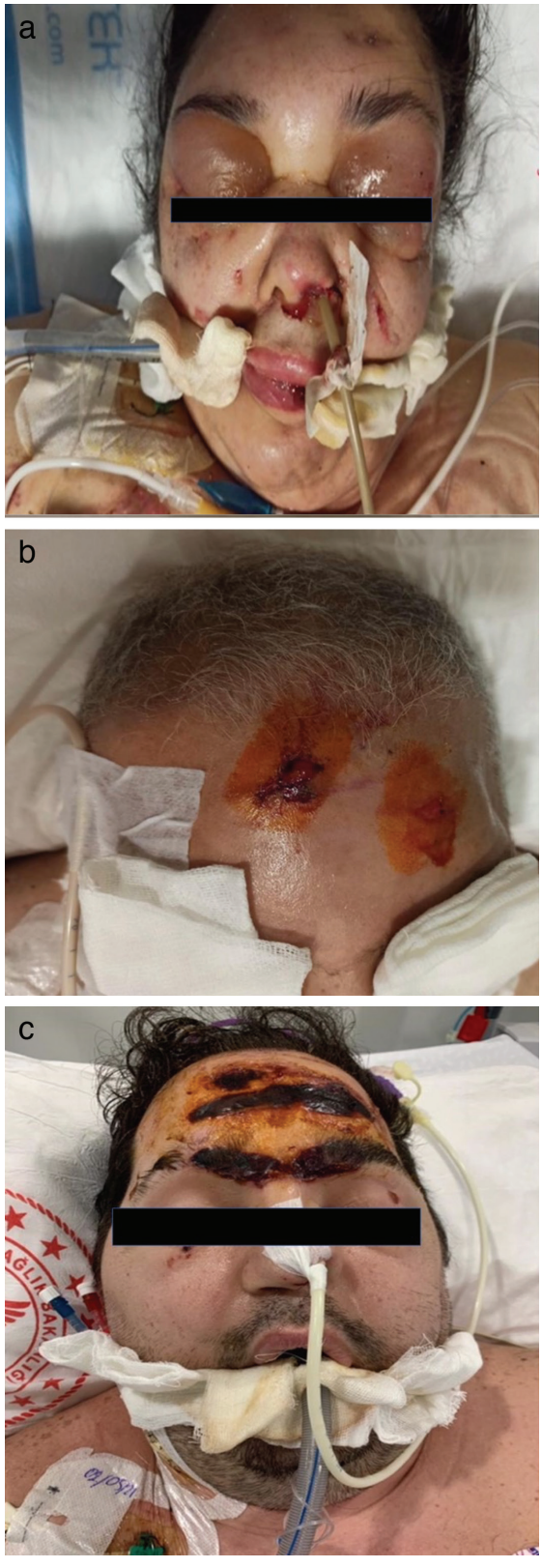

Figure 1. Pressure ulcers on the forehead in patients. (a) Stage 1 pressure ulcers on forehead and nose, severe eyelid edema due to prone position. (b) Unilateral stage 2 pressure ulcers. (c) Bilateral widely disseminated stage 3 (the area has a crater-like appearance due to damage below the skin's surface) pressure ulcers

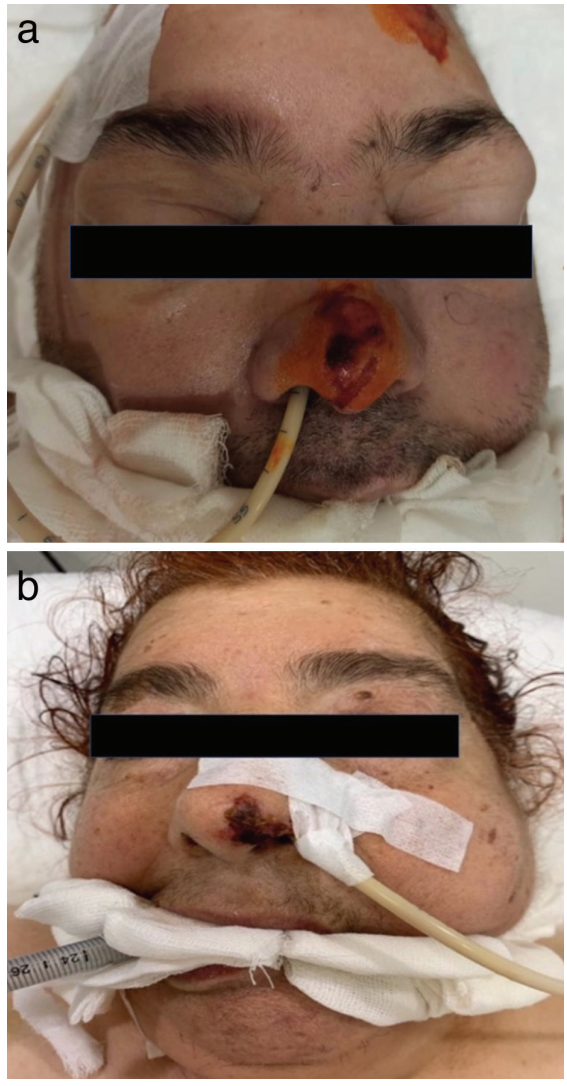

Figure 2. Pressure ulcers on the nose and forehead in patients. (a) Unilateral stage 1. Pressure ulcer on forehead (the area looks red and feels warm to the touch. With darker skin, the area may have a blue or purple tint. The person may also complain that it burns, hurts, or itches) and stage 2 pressure ulcer on forehead. (b) unilateral stage 3 pressure ulcers on the nose

Table 2. Pressure ulcer areas in patients

Variable	%	n
Forehead	80%	16
Nose	25%	5
Eye	10%	2
Chin	15%	3
Cheek	10%	2
Knee	25%	5
Thorax and anterior abdomen	40%	8
Lip edge	10%	2
Shoulder	5%	1
Sacrum	5%	1

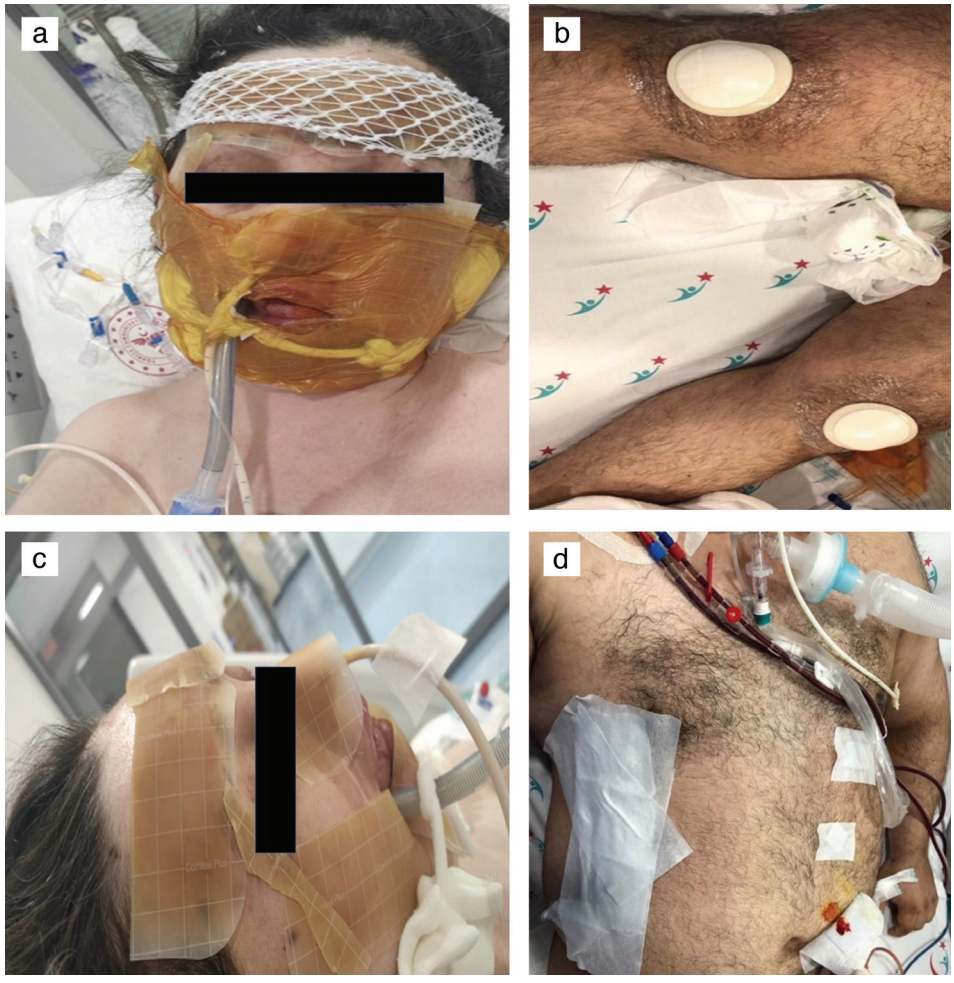

Figure 3. Approach to pressure ulcers; wound care and protective barriers in patients. (a) The pressure on the affected areas (forehead, cheek, nose and chin) is removed, and the wound is protected with gauze and special dressings. (b) Knees protected with dressing and gauze. (c) Areas that are expected to be affected (forehead, cheek, nose and chin) are protected with special protective dressings of different sizes. (d) Anterior abdomen is protected with gauze

in the present study and this requires us to consider the long-term PP as a possible risk factor over MV in the development of PU in this patient group. In group II, it was under 12 hours.

In a prospective multicentre randomized controlled study including patients with severe ARDS by Girard et al. (18) prone positioning was associated with higher PU than supine position, while invasive MV, number of hospital stay, age >60 years, female gender, a body mass index of >28.4 kg/m^2, and a simplified acute physiology score II of >46 at inclusion were shown as covariates independently associated with the development of PU. It was emphasized that these patients would need active protection.

These ulcers are painful and significantly reduce a person's quality of life. Management of ulcers is expensive and negatively impacts the success of cost-effective, efficient care delivery (10). In our patient group, all ulcers were treated with dressings. The use of dressings such as hydrocolloids, clear film and silicone has been beneficial in reducing facial skin deterioration. The use of multi-layered silicone foam dressings as tissue protectors on the forehead and chin. Similarly, chin dressing has been shown to reduce the stress exposure of soft tissues and strain energy densities by 78% and 92%, respectively (19).

Pain, hypotension, hyperthermia, decreased consciousness level, hypoalbuminemia, low Hb levels, malnutrition, dehydration, smoking, advanced age, excessive humidity are other known risk factors (16,20,21).

Comorbidities such as asthma, COPD, diabetes, and obesity cause patients to become bedridden and live a sedentary life for longer, which increases their risk of developing PU (15). While DM and HT was the most common comorbid conditions in our patients, 25% of the patients who developed PU had no comorbidities. However, the Hb levels of these patients were lower than those in the other group (9.82 g/L vs. 11.15 g/L). Similarly, Alb levels

of the patients in group I was low (26.3 g/dL vs. 29.05 g/dL) and CRP, one of the acute phase reactants, was high (109.8 mg/L vs. 80.19 mg/L).

It has been emphasized that the risk of PU increases when the duration of hospital stay in the ICU is extended (22). However, in the present study, there was no difference between the groups in the number of the days of hospital stay [group I, 15.05 (6-26)/day; group II, 15.67 (2-114)/day]. All of these patients generally required long-term high-level intensive care due to COVID-19-related ARDS. Prolonged stay in the PP, low Alb and Hb levels were the factors distinguishing patients with PU from other patients. Insufficient oxygen delivery to the tissues leads to ischemia and this may cause the development of PU (23). Anemia should be treated in these patients.

A pressure of 60-70 mmHg against the skin is sufficient to develop a pressure sore within one to six hours. Decreased blood flow due to decreased capillary blood pressure may cause ischemia, hypoxia, and necrosis in tissues (20). With a set of equipment and devices required for the treatment of COVID-19 (antiembolic stockings, nasogastric tubes, endotracheal tube and mask, central venous catheters, CRRT therapy catheters) which may cause an increased risk of tissue damage, it is obvious that this results in increased facial PS (6). In the Montgomery et al. (24) study, in patients diagnosed with COVID-19; age, male gender, risk of mortality, severity of illness, and long hospital stay were found to be risk factors. The effects of PP were not studied in this study.

When a patient is in the PP, it is recommended to position the patient in the swimmer position, reposition him/her every 2 hours, and keep the skin clean. When the patient is positioned supine, the evaluation of pressure points and early mobilization should be encouraged (12).

Study Limitations

There are some limitations to the present study. First, this study was done in a single centre with a limited number of patients. The duration of uninterrupted prone positioning was 24 hours (16-32) among the study patients. The patients were positioned prone for an average of 5.75 times (2-12) and at least 16 hours during the care unit stay. Statistical analysis of PP time and other risk factors associated with PU is difficult in this study. Because the number of cases is limited to 20. A larger number of patients are necessary for a more accurate analysis, the exclusion of observational biases and a deeper analysis of the risk factors most related to PU.

CONCLUSION

Particular attention should be paid to patient groups with a Braden score ≤13. PU are a preventable condition. The measures to be taken to prevent these wounds are easier and less costly. It is essential that risk factors relevant to clinical practice be identified. Although the risk factors that play a role in the development of PU such as anemia, hypoalbuminemia, long-term MV and prolonged ICU stay are known, situations that require prolonged prone positioning, such as in COVID-19 related ARDS patients, are independent risk factors for the development of PU.

In order to prevent PU in these patients, it is important to observe early symptoms and make appropriate interventions, and to change positions frequently.

Ethics

Ethics Committee Approval: In the study, the patients who developed PU due to PP between patients who were admitted to the COVID-19 ICU between March 1, 2021 and May 31, 2021 were analyzed retrospectively with the approval of University of University of Health Sciences Turkey, Prof. Dr. Cemil Tascioglu City Hospital Local Ethics Committee (date: 24.05.2021, protocol number: 213) and was conducted in accordance with the Helsinki Declaration.

Informed Consent: Written informed consent was obtained from the patients for their anonymized information to be published in this article.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: E.A.T., H.K., S.M., F.G., H.S., N.K., N.T., Concept: E.A.T., H.K., H.S., N.T., Design: E.A.T., H.K., S.M., F.G., H.S., N.K., N.T., Data Collection or Processing: H.K., S.M., H.S., N.K., Analysis or Interpretation: E.A.T., F.G., N.K., Literature Search: S.M., F.G., H.S., N.K., N.T., Writing: E.A.T., N.T.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Lima Serrano M, González Méndez MI, Carrasco Cebollero FM, Lima Rodríguez JS. Risk factors for pressure ulcer development in intensive care units: a systematic review. Med Intensiva 2017;41:339-46.
2. Karahan A, AAbbasoğlu A, Işık SA, Çevik B, Saltan Ç, Elbaş NÖ, et al. Factors affecting wound healing in individuals with pressure ulcers: a retrospective study. Ostomy Wound Manage 2018;64:32-9.

3. Li X, Ma X. Acute respiratory failure in COVID-19: is it "typical" ARDS? Crit Care 2020;24:198.

4. Perrillat A, Foletti JM, Lacagne AS, Guyot L, Graillon N. Facial pressure ulcers in COVID-19 patients undergoing prone positioning: how to prevent an underestimated epidemic? J Stomatol Oral Maxillofac Surg 2020;121:442-4.

5. Ng JA, Miccile LA, Iracheta C, Berndt C, Detwiller M, Yuse C, Tolland J. Prone positioning of patients with acute respiratory distress syndrome related to COVID-19: A Rehabilitation-Based Prone Team. Phys Ther 2020;100:1737-45.

6. Munshi L, Del Sorbo L, Adhikari NKJ, Hodgson CL, Wunsch H, Meade MO, Uleryk E, Mancebo J, Pesenti A, Ranieri VM, Fan E. Prone position for acute respiratory distress syndrome. A systematic review and meta-analysis. Ann Am Thorac Soc 2017;14:S280-8.

7. Maveddat A, Mallah H, Rao S, Ali K, Sherali S, Nugent K. Severe acute respiratory distress syndrome secondary to coronavirus 2 (SARS-CoV-2). Int J Occup Environ Med 2020;11:157-78.

8. Berktaş Kılınç C, Zincirci M, Gün İ, Turgut N, Karacalar S, Duran Yakar N, et al. Correlation of risk factor of pressure ulcer using the braden risk assessment scale. Eur Arch Med Res 2021;37:83-8.

9. Ibarra G, Rivera A, Fernandez-Ibarburu B, Lorca-García C, Garcia-Ruano A. Prone position pressure sores in the COVID-19 pandemic: the Madrid experience. J Plast Reconstr Aesthet Surg 2021;74:2141-8.

10. Moore Z, Patton D, Avsar P, McEvoy NL, Curley G, Budri A, Nugent L, Walsh S, O'Connor T. Prevention of pressure ulcers among individuals cared for in the prone position: lessons for the COVID-19 emergency. J Wound Care 2020;29:312-20.

11. Kallet RH. A comprehensive review of prone position in ARDS. Respir Care 2015;60:1660-87.

12. Team V, Team L, Jones A, Teede H, Weller CD. Pressure injury prevention in COVID-19 patients with acute respiratory distress syndrome. Front Med (Lausanne) 2021;7:558696.

13. Winearls S, Swingwood EL, Hardaker CL, Smith AM, Easton FM, Millington KJ, et al. Early conscious prone positioning in patients with COVID-19 receiving continuous positive airway pressure: a retrospective analysis. BMJ Open Respir Res 2020;7:e000711.

14. Magro C, Mulvey JJ, Berlin D, Nuovo G, Salvatore S, Harp J, Baxter-Stoltzfus A, Laurence J. Complement associated microvascular injury and thrombosis in the pathogenesis of severe COVID-19 infection: A report of five cases. Transl Res 2020;220:1-13.

15. Percy P. Initial observation on pressure ulcers and COVID-19. Wounds UK 2020;16:45-47.

16. Ranzani OT, Simpson ES, Japiassú AM, Noritomi DT; Amil Critical Care Group. The challenge of predicting pressure ulcers in critically Ill Patients. A multicenter cohort study. Ann Am Thorac Soc 2016;13:1775-83.

17. Irmak F, Baş S, Sızmaz M, Akbulut HA, Karşıdağ SH. Management and treatment of pressure ulcers: clinical experience. Sisli Etfal Hastan Tip Bul 2019;53:37-41.

18. Girard R, Baboi L, Ayzac L, Richard JC, Guérin C; Proseva trial group. The impact of patient positioning on pressure ulcers in patients with severe ARDS: results from a multicentre randomised controlled trial on prone positioning. Intensive Care Med. 2014;40:397-403.

19. Peko L, Barakat-Johnson M, Gefen A. Protecting prone positioned patients from facial pressure ulcers using prophylactic dressings: A timely biomechanical analysis in the context of the COVID-19 pandemic. Int Wound J 2020;17:1595-606.

20. Karayurt Ö, Akyol Ö, Kılıçaslan N, Akgün N, Sargın Ü, Kondakçı M, et al. The incidence of pressure ulcer in patients on mechanical ventilation andeffects of selected risk factors on pressure ulcer development. Turk J Med Sci 2016;46:1314-22.

21. Arisandi D, Ogai K, Urai T, Aoki M, Minematsu T, Okamoto S, et al. Development of recurrent pressure ulcers, risk factors in older patients: a prospective observational study. J Wound Care. 2020;29:S14-24.

22. Fife C, Otto G, Capsuto EG, Brandt K, Lyssy K, Murphy K, Short C. Incidence of pressure ulcers in a neurologic intensive care unit. Crit Care Med 2001;29:283-90.

23. Willyard C. Coronavirus blood-clot mystery intensifies. Nature 2020;581:250.

24. Montgomery AP, Patrician PA, Hall A, Miltner RS, Enogela EM, Polancich S. Modeling patient risk for hospital-acquired pressure injuries during COVID-19: a retrospective study. J Nurs Care Qual 2022;37:162-7.