

EFFECT OF SEMI-FOWLER POSITION DURING SUCTIONING ON OXYGENATION AMONG PATIENTS WITH BRAIN TRAUMA

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ABSTRACT

Brain trauma is an imperative concern for preventable mortality and disability throughout the lifespan. **Aim: The study aimed** to evaluate the effect of the semi-fowler position during suctioning on oxygenation among patients with brain trauma. **Subjects and Method: Design:** a quasi-experimental design was used in this study. **Setting:** This study was implemented at the Suez-Canal University Hospitals, specifically at the critical care units. **Subjects:** a purposive sample that included 100 mechanically ventilated patients on pressure-controlled mode, distributed randomly by half into control and study groups. **Tools:** The first tool is called the patient's physiologic parameters questionnaire, which consists of two parts (patient's profile and oxygenation as indicated by ABGs values). The second tool is called the hemodynamic (cardiorespiratory) parameters recording sheet to assess and evaluate PR, RR, BP, MAP, and CVP. **Results** showed that (42%, 46%) of the participants were diagnosed with epidural hemorrhage among the control and study groups, respectively, with a high statistically significant improvement in PH, PaO₂, SaO₂, and PaCO₂ values, in addition to the hemodynamic (cardiorespiratory) parameters among the study group after suctioning at the semi-fowler position. **Conclusion** study concluded that total oxygenation value was increased significantly in the study group with (86.70± 8.49) compared to (80.70±6.30) in the control group after endotracheal suctioning at 30 degrees head of bed elevation (HOBE) with P = 0.001. **Recommendations:** Further research is required to examine the long-term effects of HOBE on oxygenation and different hemodynamic functions in relation to the critical care unit's stays.

Keywords: Oxygenation, Patients with Brain Trauma, Semi-Fowler Position, Suctioning

INTRODUCTION

Brain Trauma (BT) is a foremost clinical practice issue faced by critical care nurses, and patients' positioning has a profound effect on the hemodynamic stability and oxygenation of these patients. According to the Centers for Disease Control and Prevention, 1.7 million people or more are affected by BT each year, with 53,000 deaths and 500,000 permanent neurologic damage as a primary disease complication (CDC, 2016). In Egypt in 2016, the overall BT incidence was 2,124 patients, classified as mild injury (62%), moderate injury (17.5%), and severe injury (20.5%) (Taha et al., 2021).

Endotracheal suctioning is an elective invasive procedure needed for mechanically ventilated patients to prevent the buildup of secretions within their lungs and the additional hazards accompanying it. But as with all invasive devices, it may lead to different adverse effects, especially in patients with BT. Insertion of the suctioning catheter into the endotracheal tube triggers patients to cough by stimulating both tracheal and laryngeal afferent nerves. That increases the intra-abdominal and intra-thoracic pressure transitorily from the Valsalva maneuver done by the patient at this time. Finally, all of these physiologic reactions affect the cerebral hemodynamics; leading simultaneously to intracranial pressure (ICP) hypertension, in addition to a decrease in cerebral pressure perfusion (CPP) and oxygenation (Uraz & Aksoy, 2012).

Hemodynamic monitoring is the study of blood movement or flow, as stated by Newman (2013). It can be done by the nurse through an examination of the cardiorespiratory physical aspects and peripheral vascular physiological characteristics. Monitoring for hemodynamic parameters can be done by invasive or non-invasive methods. Invasive pulmonary arterial catheters give the most needed data to evaluate the circulatory status, but they entail critical care circumstances. The none-invasive methods, as well as the invasive methods provide the essential information and prevent further patient deterioration (Ismail et al., 2021).

The ICU admission, mechanical ventilation, and BT trigger different structural and functional changes encompassing a reduction in expiratory force and respiratory muscles, poor mucociliary clearance, upper airway colonization, and swallow dysfunction. The nurse judges the critically ill patient clinically based on physiological and scientific evidence to prevent complications and achieve optimal patient outcomes (Alan and

Khorshid, 2019). So, to minimize the incidence of these complications and improve oxygenation side by side with hemodynamic parameters optimization of patients' ventilation and perfusion, in addition to promoting effective pulmonary gas exchange, therapeutic positioning should be done by the nurse with the HOB elevated at least 30 degrees (Taha et al., 2021).

Care of patients with BT requires a professional critical care nurse. She has an important role, particularly in fulfilling patients' oxygenation needs and hemodynamic monitoring, in addition to assessing and monitoring factors affecting them. Among these factors are the patients' positioning and suctioning. However, studying the effect of endotracheal suctioning with elevating the head of the bed 30 degrees on oxygenation among critically ill patients is needed further. Critical care nurses should have basic knowledge and skills to identify, monitor, and maintain oxygenation and hemodynamic functions in critically ill patients, especially those with BT (Asfour, 2016).

The significance of the study:

Although BT is a critical universal public health problem, the actual incidence is difficult to establish. But by 2030, BTs are expected to jump to the 7th cause of death as a result of road traffic accidents (RTA), followed by the 17th cause as a result of falls (Taha et al., 2021). In the United Kingdom (UK), countless survivors of BT could have persistent severe neurological disability. (Mir et al., 2015).

Caring for patients with BT is a challenging critical nursing practice, and maintaining adequate arterial oxygenation is central to these patients. In neurosurgical ICUs, the therapeutic 30° HOBE is a routine clinical nursing practice as it is a simple and competent approach to preventing secondary injury in patients with severe BT by reducing ICP and maintaining sufficient CPP, which occurs through reduction of the MAP and maintenance of cerebral blood flow (CBF), in addition to improving oxygenation and hemodynamic parameters (EL Mokadem & EL-Sayed, 2020).

The American Association of Neuroscience Nurses (AANN) 2020 stated that critical care nurses must monitor the BT patients' oxygenation and hemodynamic functions and be aware of the various nursing interventions' effects on these parameters to help them plan care that is individualized and patient-centered. Promoting safety in BT patients can be achieved through suctioning patients in the proper position.

To the researchers' knowledge, the effect of patient position during suction on oxygenation has rarely been researched, and there is no strong evidence for this event. Therefore, this study aims to evaluate this research point, which is very imperative for nursing practice.

Study aimed to:

Evaluate the effect of the semi-fowler position during suctioning on oxygenation among patients with brain trauma.

Objectives:

1. Determine BT patients' arterial oxygenation.
2. Assess BT patients' hemodynamic (cardiorespiratory) function.
3. Investigate the effects of suctioning patients in a semi-fowler position with BT on oxygenation and hemodynamic function.

Hypothesis

Suctioning in the semi-fowler position with the head of the bed elevated for 30 degrees will improve oxygenation and hemodynamic function among patients with BT in the study group compared with the control group.

Operational definitions:

Oxygenation: In the present study, it is defined as the measurement of arterial oxygen partial pressure (PaO₂), arterial carbon dioxide partial pressure (PaCO₂), and arterial oxygen saturation (Sao₂) from the arterial blood gas laboratory test of unconscious mechanically ventilated patients with brain trauma.

SUBJECTS AND METHOD

Design: A quasi-experimental design utilizing two groups (control and study).

Setting: This study was conducted at the intensive and neurosurgical critical care units affiliated with Suez-Canal University Hospitals, Ismailia City, Egypt. The Intensive Care

Unit (ICU) contains sixteen beds, and the average monthly entry of BT cases ranges from 120 to 150 cases. The neurosurgical critical care unit contains two beds, with an average monthly entry rate that ranges from 20 to 28 cases. The study was implemented from the beginning of November 2020 till the end of May 2021.

Subjects: The study included 100 male and female patients who were admitted to the previously mentioned settings during the study period and were randomly assigned to one of 50 groups from both the control and study groups. The sample included in the study was purposive as patients were chosen under *certain criteria*, such as:

- Adults aged from 19 to 60 years old
- Diagnosed as closed brain trauma.
- It is not acceptable to have a Glasgow Coma Scale (GCS) score of less than eight.
- Mechanically ventilated patients in pressure-controlled mode.

Exclusion Criteria

- Feverish patients
- Spinal cord injury patients
- Brain death patients
- Ischemic patients

The sample size was calculated guided by a statistical Equation expressed as:

$$\text{Sample size (ss)} = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where:

Z = A value of (1.96 for 95% confidence level)

p = percentage used for sample size needed expressed as decimal (0.5)

c = is the confidence interval, which expressed as decimal (0.04 = ± 4)

Tools of Data Collection: To collect data, the researchers used two instruments throughout all phases of the study.

The tool I: Physiological Parameters questionnaire, it develop by the researchers to assess the patients' oxygenation condition which has two parts. Part I: is called the "patient's profile," in which data was obtained by the researchers from the patients' medical records at the primary phase of data collection. It included data about age, sex, and medical diagnosis. Part II-Oxygenation Recording Sheet to assess the patients' values of arterial blood gases (ABGs) such as PH, PaO₂, and PaCO₂, in addition to SaO₂. It was implemented using a RAPID Point 500 blood gas analyzer that was calibrated every 2 hours. The Rapid Point 500 reliability was higher than 0.91 by the intra and inter-assay coefficients (EL-Mokadem & EL-Sayed, 2020). Scoring was implemented by comparing the patients' values to normal values.

Tool II: Hemodynamic parameters recording sheet adopted from (Kirkman & Smith, 2014; Thomas et al., 2015). to assess and evaluate the patients' cardiorespiratory function such as Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Respiratory Rate (RR), Pulse Rate (PR), and Mean Arterial Pressure (MAP); these data were attained from the patients' bedside monitors. The Mean Arterial Pressure (MAP) was calculated by summing the Systolic Blood Pressure plus (Diastolic Blood Pressure)2 and then dividing by 3. The same instrument was used to assess and evaluate the central venous pressure (CVP), which was measured manually. The tool had good reliability as Cronbach's Alpha equaled 0.87PT

The score was computed based on several measurements of the hemodynamic parameters; higher scores resemble more severe diseases with low parameters, and lower scores resemble less severe diseases with high parameters. The normal physiological parameter measurements were matched with higher or lower scores to calculate the score truly.

Validity of the tools:

The suggested data collection tools were tested for face validity and content validity by seven specialists in medical-surgical and critical care nursing, in addition to five doctors from anesthesiology and intensive care medicine, to evaluate the clarity, easiness,

and suitability of the instruments' items to attain the aim of the study. Their opinions differed regarding the consistency, format, accuracy, layout, and relevancy of the tools.

The reliability of the instruments was implemented using Cronbach's Alpha test to measure the internal consistency of the tools. It was mounted at 0.824 for the hemodynamic parameters recording sheet and more than 0.91 for the oxygenation recording sheet.

Pilot Study:

carried out on ten patients because they represented 10% of the total sample size. The pilot study was conducted to test the applicability and clarity of the used tools. Also, it functioned to approximate the required time to fill in the study tools. Based on the results of the pilot study, minor corrections were made. So, piloted patients existed within the chief study sample.

Fieldwork

- **Preparatory Phase**

This phase included extensive review of evidence and literature related to the present study using national and international resources for developing instruments to evaluate the effect of position during suctioning on hemodynamic parameters and oxygenation among patients with brain trauma. Tools were used in the English language without translation, as the researchers were the ones responsible for completing the tools. At this phase, the researchers obtained the needed agreements and permissions to implement the study.

- **Assessment phase**

One hundred adult mechanically ventilated patients on pressure-controlled mode and diagnosed with BT were chosen purposively and then categorized randomly into two equal categories (50 participants for each). The researchers randomly assigned the participants to either the study or control group using a simple random method. The researchers determined days of the week alternatively, as patients meeting on odd days were assigned to the control group, and patients meeting on even days were assigned to the study group, as well as the required number of participants completed.

- **Planning phase:**

Researchers planned for the control group to receive routine endotracheal suctioning in a supine position. But the study group receive the predetermined intervention that involved 30 degrees of head of bed elevation during endotracheal suctioning.

- **Implementation phase:**

The researchers visited the study settings four times weekly (Saturday, Sunday, Wednesday, and Thursday) for the morning shift and afternoon shift to collect data. A 30 degree head of bed elevation was implemented before endotracheal suctioning for 15 minutes. The choice of this degree of elevation is based on the traditional CDC recommendations prescribed for BT patients as well as anatomical and scientific data.

All patients were positioned semi-fowler 30° for 15 minutes until stabilization of their hemodynamic parameters was achieved, with no nursing activities being done during these 15 minutes in order not to affect the patients' hemodynamic parameters. ABGs and hemodynamic parameters were measured before practicing endotracheal suctioning for both groups to have baseline data. The FiO₂ was increased to 100% for one minute, and then a sterile catheter was inserted into the endotracheal tube to perform suctioning for less than 30 seconds according to the protocol of care. After finishing the endotracheal suctioning, the FiO₂ was maintained for 30 seconds at 100%, then MAP and hemodynamic parameters were measured, followed by drawing an arterial blood sample to assess the patients' ABGs. For both the control and study groups; head rotation, saline instillations into the tube, or hyperinflation were avoided. Moreover, there was no change in the ventilator mode and/or IV sedation.

- **Evaluation phase:**

Evaluation of both groups of the studied patients was done twice during the study; the first one was at pre-intervention, which is called baseline assessment, and the second one was at post-intervention, which is called evaluation. The comparison was done between pre and post-intervention using the same study tools to examine the effectiveness of semi-fowler position during endotracheal tube suctioning on oxygenation and hemodynamic functions among patients with brain trauma.

Ethical Considerations

After the explanation of the study aim and objectives, official permission to implement the study was obtained by the researchers, and the patients' relatives were asked to participate in the study orally if they met the study inclusion criteria. This type of patient was considered a vulnerable group, as all of the patients included in the study were comatose and had a Glasgow coma scale (GCS) of less than eight.

At the initial interview, the researchers informed the included patients' relatives about the purposes of the study, the intervention that will be implemented on their patients, and the benefits that their patients will get. Also, the researchers explained to the relatives that participation in the study is voluntary and that they can withdraw their patient from the study at any time without penalty, while maintaining confidentiality and anonymity of patients. Moreover, approval of the research was obtained from the Ethical Committee of the Faculty of Nursing before starting the study.

Statistical Analysis

The data was processed using SPSS version (24), and the obtained data was tested using the most suitable statistical analysis. Descriptive data was tested using frequency, percentage, mean, and standard deviation. Also, the F-test and t-test were used for comparing results according to types of compared data for comparisons between qualitative variables, and the significance level was set at $p \leq 0.05$.

RESULTS

Table (1): expressed no statistically significant differences among both of the study groups related to patients' assessment data. Around half of the control group (56%), and 58% of the study group, were aged 25–30 years old. The mean age for the control group was 33.10 ± 8.80 and the study group was 35.10 ± 8.78 . The same table also shows that 74% of the control group and 82% of the study group were males. Around half (42%) of the control group and 46% of the study group were diagnosed as having epidural hemorrhage.

Table (2): shows a statistically significant improvement among both groups under the study regarding the effect of 30 degrees of head of bed elevation on arterial oxygenation during endotracheal tube suctioning. PaO_2 was increased significantly in the study group to (89.33 ± 11.50) compared with (82.42 ± 6.4) in the control group ($P = 0.003$). The study group's SaO_2 value increased significantly to (94.64) compared to

(906.3) in the control group ($P = 0.000$). Moreover, PaCO_2 significantly decreased to (36 ± 7.3) in the study group, compared to (37 ± 9.0) in the control group ($P = 0.000$). Also, PH was significantly increased to (7.40 ± 0.03) in the study group, compared to (7.33 ± 0.07) in the control group.

Table (3): shows that the total arterial oxygenation value was increased significantly in the study group with (86.70 ± 8.49) compared to (80.70 ± 6.30) in the control group after endotracheal suctioning with 30 degree head of bed elevation ($P = 0.001$).

Table (4): shows a highly statistically significant improvement in hemodynamic function among both groups under the study after 30 HOBE (semi-fowler position) compared with the initial assessment before the intervention ($P 0.001$). The pulse rate significantly improved correspondingly to be (87.53 ± 7.2 , 92.44 ± 6.4) among the study and the control group with ($P < 0.001$) compared with (99.4 ± 4.3) at the initial assessment. Also, the respiratory rate improved significantly from (24 ± 3.3) in the initial assessment to (21 ± 4.4 , 22 ± 5.5) among the study and the control group correspondingly ($P 0.05$).

Moreover, the systolic and diastolic blood pressure was decreased significantly from (135.2 ± 10.3 / 87.13 ± 7.3) in the initial assessment into (122.63 ± 11.7 / 72.12 ± 6.8 , 130.8 ± 11.7 / 79.9 ± 7.6) among the study and the control group correspondingly. Also the central venous pressure was improved significantly from (3.45 ± 1.70) at the initial assessment into (3.22 ± 1.67 , 3.36 ± 1.25) in the study and control group respectively. Moreover, the mean arterial pressure was decreased significantly from (87.62 ± 7.1) at the initial assessment into (80.30 ± 6.4 , 83.02 ± 5.9) among the study and the control group correspondingly with ($P < 0.001$).

Table (1): Patients' profile for both groups (Control and Study) throughout the study phases (n=100).

Assessment data	Control Group (n=50)		Study Group (n=50)		t-test	P-value
	No	%	No	%		
Age						
▪ 18 - 24 yrs	12	24	10	20	0.526	0.59
▪ 25 - 30 yrs	28	56	29	58		
▪ 31 - 50 yrs	10	20	11	22		
Mean \pmSD	33.10\pm8.80		35.10\pm8.78			
Sex						
▪ Male	37	74.0	41	82.0	0.505	0.78
▪ Female	13	26.0	9	18.0		
Diagnosis						
▪ Epidural Hemorrhage	21	42.0	23	46.0	3.313	0.51
▪ Subdural Hemorrhage	13	26.0	15	30.0		
▪ Subarachnoid Hemorrhage	16	32.0	12	24.0		

Table (2): Effect of 30 Degrees Head of Bed Elevation on Arterial Oxygenation during Endotracheal Tube Suctioning (n=100).

Arterial Oxygenation	Before intervention X \pm SD (n=100)	Post-intervention with 15 minutes		F	p-value
		Study Group X \pm SD (n=50)	Control Group X \pm SD (n=50)		
PH	7.30 \pm 0.04	7.40 \pm 0.03	7.33 \pm 0.07	11.78	0.05 *
PaO₂	75.48 \pm 10.56	89.33 \pm 11.50	82.42 \pm 6.4	16.08	0.003*
SaO₂	86 \pm 6.8	94 \pm 6.4	90 \pm 6.3	12.41	0.000**
PaCO₂	40 \pm 7.6	36 \pm 7.3	37 \pm 9.0	13.66	0.000**

Table (3): The Effect of 30 Degrees Head of Bed Elevation on Total Arterial Oxygenation during Endotracheal Tube Suctioning (n=100)

Arterial Oxygenation	Control Group (n=50)	Study Group (n=50)	t-test	p- value
X \pm SD	80.70 \pm 6.30	86.70 \pm 8.49	10.45	0.001**

Table (4): The Effect of 30 Degrees Head of Bed Elevation on the hemodynamic (cardiorespiratory) function (n=100).

Hemodynamic parameters (cardiorespiratory)	Before intervention X \pm SD (n=100)	Post-intervention with 15 minutes		F	p-value
		Study Group X \pm SD (n=50)	Control Group X \pm SD (n=50)		
Pulse rate	99.4 \pm 4.3	87.53 \pm 7.2	92.44 \pm 6.4	12.85	<0.001**
Respiratory rate	24 \pm 3.3	21 \pm 4.4	22 \pm 5.5	13.67	<0.05*
Systolic pressure	135.2 \pm 10.3	122.63 \pm 11.7	130.8 \pm 11.7	11.45	<0.001**
Diastolic pressure	87.13 \pm 7.3	72.12 \pm 6.8	79.9 \pm 7.6	12.77	<0.001**
Central venous pressure	3.45 \pm 1.70	3.22 \pm 1.67	3.36 \pm 1.25	14.08	<0.001**
Mean arterial pressure	87.62 \pm 7.1	80.30 \pm 6.4	83.02 \pm 5.9	13.88	<0.001**

DISCUSSION:

In critically ill mechanically ventilated patients, vital signs should be measured frequently, including oxygen saturation, which is a critical one. Endotracheal tube suctioning and positioning may contribute to oxygen desaturation as well as many other factors (Enferm et al., 2010). There are several therapeutic interventions evidenced to reduce cardiorespiratory complications in mechanically ventilated patients, including HOBE, which is very important, simple, cheap, and easy to improve oxygenation (Spooner et al., 2014).

Although the availability of literature regarding the effects of various positions on patients' oxygenation and hemodynamic parameters; few studies examined the effects of a 30-degree HOBE during endotracheal tube suctioning on hemodynamic functions and arterial oxygenation in patients with BT. To the best of our familiarity, this is the first time to confirm that HOBE has a significant effect on improvements in oxygenation and hemodynamic parameters, which is confirmed by this study.

The results of the current study did not exhibit any statistically significant differences in the demographic characteristics among both groups under the study. According to the findings, approximately half of the study sample was 25–30 years old, with the majority being males and diagnosed with epidural hemorrhage in both groups. These findings could be related to the engross of males at this age in activities such as driving and sports, which lead to different types of accidents and induce any type of BT.

In the same line, a descriptive exploratory study by Okasha et al. (2013) in Cairo on 39 patients admitted with acute BT, to compare the effects of both the supine and semi-fowler position on patients' cerebral perfusion pressure. The study found that more than half were aged 25–30 years old among the studied patients, with the majority of patients being male, and one-quarter were diagnosed as having brain contusion.

In contrast, a quazi-experimental study by Taha et al., (2021) in Benha, that studied patients with BT to evaluate the effect of semi-fowler position on hemodynamic function, revealed that the majority of studied patients were males, with more than one-third aged 38 to less than 48 years old.

The existing study exhibited a statistically significant improvement in arterial oxygenation with a highly significant increase in total oxygenation value after endotracheal tube suctioning with 30 degree HOBE among both groups. Moreover, there was a highly statistically significant improvement in hemodynamic function among both groups under the study after 30 HOBE (semi-fowler position) compared with the initial assessment before implementing the intervention. These results may be owing to the fact that this position leads to diaphragm lowering and alveolar expansion increasing, which maximizes lung volumes by decreasing the pressure relied on the diaphragm caused by the pressure from the abdominal contents. This intensifies the respiratory system obedience, causing PaO₂ increase and PaCO₂ decrease.

This study supports Okasha et al. (2013) who reported that systolic blood pressure, SpO₂, PaO₂, SaO₂, and mean arterial blood pressure were statistically increased, but the respiratory rate and PaCO₂ decreased significantly. Also, Shah (2012), who compared the effects of side-lying and semi-fowler positions on pulse oximetry and tidal volume among ICU patients, found that in the semi-fowler position, PaO₂ increased significantly and PaCO₂ decreased significantly.

Moreover, Mehta & Parmar (2017) performed a study on patients with head injuries at the Intensive Care Unit about the Effect of Positions on Oxygenation and found that there were high statistically significant relations between the mean values of arterial oxygen saturation, heart rate, respiratory rate, and blood pressure and the semi-fowler's position. Also, Oddo & Bösel (2014), who monitored brain and systemic oxygenation in neuro-critical care, found that the semi-fowlers' positioning has a statistically significant relationship with the patients' arterial oxygenation results.

A study by Ledwith et al. (2010) to inspect patients with acute neurological disorders for the effect of body position on physiological parameters and cerebral oxygenation, is contrasted with the results of the current study, as they found that changes in HOBE elevation had no significant changes in patients' physiological parameters. Also, Elizabeth and Winslow (2012) itemized that breathing becomes easier with the right position as the respiratory rate decreased and tidal volume significantly increased compared with the high fowler's position; and at 45 degrees, the respiratory rate decreased significantly compared with the 90 degree fowler position, and the mean heart

rate elevated significantly in the high fowler position compared with the flat position. Moreover, Smith et al. (2010) identified no difference in tissue oxygenation in the 45° seated position compared with the supine position.

CONCLUSION

Based on the results of the current study, it can be concluded that the 30C HOBE (semi-fowler position) has a positive significant effect on total oxygenation in the form of arterial blood gas values (PaO₂, and PaCO₂) and oxygen saturation (SaO₂), in addition to hemodynamic parameters in the form of respiratory rate, systolic and diastolic blood pressure, and MAP, in addition to CVP.

RECOMMENDATIONS

Based on the current study findings, it is suggested that the study be replicated in different geographical areas of Egypt on a larger probability sample, with an investigation of its impact on hemodynamic stability and oxygenation in relation to ICU stays. Moreover, extra studies are needed to measure the same parameters at different body positions with comparisons among them.

Through workshops and in-service training programs, guidance should be provided to critical care nurses regarding best nursing practices following the national developed protocols on oxygenation promotion and factors affecting it among critically ill patients. Furthermore, the current study suggests that critical care nurses use HOBE 30° as routine care during endotracheal suctioning to improve arterial oxygenation and hemodynamic functions in BT patients.

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تأثير وضعية شبه الجلوس أثناء التنشيط الرغامي على الأكسجة بين مرضى الرضوض الدماغية

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الخلاصة

تعتبر الرضوض الدماغية مصدر قلق حتمي للعجز والوفاة الذي من الممكن الوقاية منهم طوال العمر. وقد هدفت هذه الدراسة إلى تقييم تأثير وضعية شبه الجلوس أثناء التنشيط على الأكسجة بين مرضى الرضوض الدماغية. منهجية البحث: تم تنفيذ هذه الدراسة في مستشفيات جامعة قناة السويس وتحديدًا في وحدات العناية المركزة، على عينة غرضية تضمنت 100 مريض خاضعين للتنفس الصناعي في وضع التحكم بالضغط، وموزعين عشوائياً إلى النصف في مجموعتين وهم مجموعة التحكم والدراسة، وذلك باستخدام التصميم شبه-التجريبي. وتضمنت أدوات الدراسة أداتين وهم: الأداة الأولى وتسمى استبيان العلامات الفسيولوجية للمريض والذي يتضمن جزئين (ملف تعريف المريض، والأكسجة التي يتم تقييمها من قيم غازات الدم)، الأداة الثانية تسمى استمارة تسجيل علامات ديناميكية الدم من خلال (القلب والجهاز التنفسي) لتقييم معدلات النبض، التنفس، ضغط الدم، متوسط الضغط الشرياني، والضغط الوريدي المركزي. ولقد أظهرت النتائج أن (42%، 46%) من المشاركين في الدراسة قد تم تشخيصهم بالنزف فوق الام الجافية وذلك بين مجموعة التحكم ومجموعة الدراسة على التوالي، مع وجود تحسن ذو دلالة إحصائية عالية في قيم غازات الدم والتي تشمل (نسبة الهيدروجين، نسبة الأكسجين بالشرابين، تشبع الدم بالأكسجين، ونسبة ثاني أكسيد الكربون بالشرابين)، بالإضافة إلى علامات ديناميكية الدم من خلال (القلب والجهاز التنفسي) بين مجموعة الدراسة بعد التنشيط في وضعية شبه الجلوس. ولقد خلصت الدراسة إلى أن قيمة الأوكسجين الكلية بالدم قد ارتفعت بنسبة ذو دلالة إحصائية في مجموعة الدراسة بمتوسط (86.70 ± 8.49) مقارنة بمتوسط (80.70 ± 6.30) في المجموعة الحاكمة بعد التنشيط عند رفع رأس السرير إلى 30 درجة. ولقد أوصت الدراسة بعمل المزيد من الأبحاث لفحص التأثيرات طويلة المدى لرفع رأس السرير درجات متفاوتة على الأكسجة ووظائف الدورة الدموية المختلفة وعلاقتها بفترة إقامة المرضى بوحدات الرعاية الحرجة.

الكلمات المرشدة: التنشيط الرغامي من الانبوبة الهوائية، وضعية شبه الجلوس، الأكسجة، الرضوض الدماغية.