Summary

Study of non-invasive mechanical ventilation in ICU patients : clinical and prognostic relevance

Thesis

Submitted for partial fulfillment of master degree in Critical Care Medicine By

Ebraam Thabet Amin

(M.B.B.Ch)

Faculty of Medicine - Fayoum University

Critical Care Medicine Department

Faculty of Medicine – Fayoum Universtiy

Fayoum University

2019

Study of non-invasive mechanical ventilation in ICU patients : clinical and prognostic relevance

Thesis

Submitted for partial fulfillment of master degree in Critical Care Medicine By

Ebraam Thabet Amin

(M.B.B.Ch)

Faculty of Medicine - Fayoum University

Supervised by

Ass.Prof. Osama Mahmoud Momtaz, MD

Assistant professor of Critical Care Medicine

Faculty of Medicine- Fayoum University

Dr. Ahmed Fathy El-khateeb, MD

Lecturer of Critical Care Medicine

Faculty of Medicine- Fayoum University

Fayoum University

2019

Summary

Introduction:

Non-invasive ventilation (NIV) is the provision of ventilatory support to the lungs without the use of an endotracheal airway. It has emerged as an important tool in the treatment of diverse forms of acute respiratory failure. It not only reduces the need for invasive mechanical ventilation and its associated complications, but also reduces the complications associated with stay in the intensive care unit, length of hospital stay, and mortality in selected patients.

(Momtaz O M et al., 2016).

The aim of the study:

Identify which patients with acute respiratory failure should be considered for NIV.

Compare the outcome of application of CPAP and BIPAP in management of acute respiratory failure.

Patients and Methods:

This descriptive study was conducted over 50 patients admitted to critical care department EL-Fayoum University from January 2018 to January 2019. The study is approved by the Ethics Committee of the Faculty of Medicine, Fayoum University.

Inclusion criteria:

Patients indicated for non-invasive mechanical ventilation were included in this study. These included patients with acute respiratory failure or acute on top of chronic respiratory failure.

Exclusion criteria:

1. Missing patient medical data.
2. Lengths of ICU stay of less than 24 hours.
3. Management by cardiopulmonary resuscitation on hospital admission.
4. Unestablished diagnosis.
5. Respiratory arrest or need for immediate intubation.
6. Hemodynamic instability.
7. Inability to protect the airway (impaired cough or swallowing).
8. Excessive secretions.
9. Agitated and confused patient.
10. Facial deformities or conditions that prevent mask from fitting.
11. Uncooperative or unmotivated patient.
12. Brain injury with unstable respiratory drive.
13. Untreated pneumothorax.

Results:

- In Group 1 (COPD group)

-There was no significant difference in improvement in the arterial neither PaO2 nor O_2 saturation by using BIPAP in comparison to using CPAP on admission and after 6, 48 h. There was a significant improvement in the arterial $PaCO_2$, arterial pH, duration of stay at ICU, avoiding endotracheal

intubation (ETI) and static compliance by using BIPAP in comparison to using CPAP after 6 and 48 h.

- In Group 2 (ILD group)

-There was no significant difference in improvement in the arterial PaO_2, O_2 saturation, RSBI, PaO_2/FiO_2 and RR by using BIPAP in comparison to using CPAP on admission and after 6, 48 h. There was a significant improvement in the arterial $PaCO_2$, arterial pH, avoiding endotracheal intubation (ETI), static compliance and duration of stay at ICU by using BIPAP in comparison to using CPAP on admission and after 6, 48 h.

- In Group 3 (Pulmonary edema group)

-There was a faster improvement in the arterial PaO_2 and O_2 saturation by using CPAP in comparison to using BIPAP on admission and after 6, 48 h. There was no significant difference in improvement in the arterial $PaCO_2$, arterial pH, avoiding endotracheal intubation (ETI), RSBI, PaO_2/FiO_2, RR, C static and duration of stay at ICU by using CPAP in comparison to using BIPAP on admission and after 6, 48 h.

- In Group 4 (Obstructive Sleep Apnea Syndrome)

-There was a faster improvement in the arterial PaO_2 and O_2 saturation by using CPAP in comparison to using BIPAP on admission and after 6, 48 h. There was no significant difference in improvement in the arterial $PaCO_2$, arterial pH, avoiding endotracheal intubation (ETI), RSBI, PaO_2/FiO_2, RR, C static and duration of stay at ICU by using CPAP in comparison to using BIPAP on admission and after 6, 48 h.

- In this study, comparison between complications in CPAP groups and BIPAP groups showed no significant difference with *p* value 0.824.
- Clinical assessment revealed non significant difference between the four groups as regard respiratory rate, pulse, systolic and diastolic blood pressure (SBP and DBP) and conscious level at time of admission.
- Regarding APACHE II score, there was a significant statistical difference in the prognosis.
- Also, there was a statistically significant difference between study groups regarding previous using of bronchodilators before admission at ICU.
- Regarding BMI, there was a significant statistical difference in the prognosis.
- There was a significant statistical difference in the prognosis regarding previous recurrent admission at hospital and/or ICU.