بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

Comparative study between noninvasive positive pressure ventilation and invasive mechanical ventilation in patients with respiratory failure

Thesis

Submitted in partial fulfillment of the Master Degree in
"Intensive Care Medicine"

By

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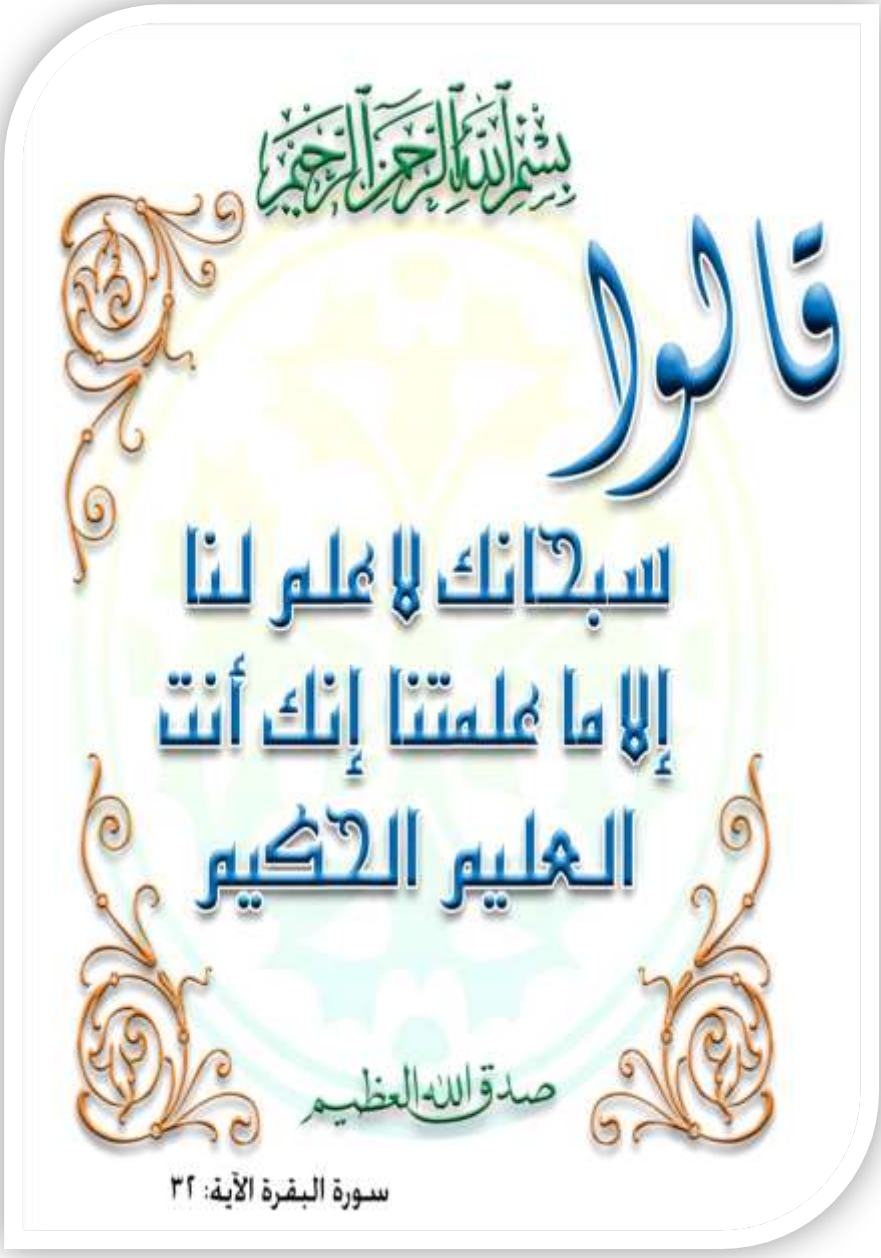
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Hesham Mohamed Houd Abotiba

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List of Abbreviations

Abbr.	Full-term
ABG	**:** Arterial blood gases
AHRF	**:** Acute hypoxemic respiratory failure
AKI	**:** Acute kidney injury
ALI	**:** Acute Lung Injury
ALS	**:** Amyotrophic lateral sclerosis
ARDS	**:** Acute Respiratory Distress Syndrome
ARF	**:** Acute respiratory failure
CBC	**:** Complete blood count
CMV	**:** Conventional mechanical ventilation
CO2	**:** Carbon dioxide
COPD	**:** Chronic Obstructive Pulmonary Disease
CPAP	**:** Continuous positive airway pressure
CPE	**:** Cardiogenic pulmonary edema
DVT	**:** Deep venous thrombosis
ECG	**:** Electrocardiography
EOA	**:** Esophageal obturator airway
f/VT	**:** Rratio of respiratory frequency to tidal volume
FiO2	**:** Fraction of inspired oxygen
FRC	**:** Functional residual capacity
ICU	**:** Intensive care unit
LMA	**:** Laryngeal mask airway

LT : Laryngeal tube

NIPPV : Non-invasive positive pressure ventilation

PaO2 : Arterial oxygen tension

PAP : Positive airway pressure

PEEP : Positive end-expiratory pressure

qSOFA : Quick Sequential Organ Failure Assessment

RF : Respiratory failure

RSBI : Rapid Shallow Breathing Index

SaO2 : Arterial oxygen saturation

SAPS3 : Simplified Acute Physiologic Score 3

sCr : Serum creatinine

SD : Standard deviation

SGA : Supraglottic airway

SPSS : Statistical Package for Social Science

UOP : Urine output

VAP : Ventilator acquired pneumonia

VC-SIMV : Volume-controlled Synchronized intermittent mandatory ventilation

VILI : Ventilator-induced lung injury

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Introduction

Mechanical ventilation is used as an alternative to spontaneous respiration. The main indication for initiation of mechanical ventilation is respiratory failure. According to patients' condition, either invasive or non-invasive ventilation may be used for the treatment of respiratory failure. Non-invasive positive pressure ventilation (NIPPV) refers to mechanical ventilation delivered through a face mask. This modality supports ventilation without needing intubation. It is often used in patients who do not require emergency intubation ***(Mas and Masip, 2014).***

Only in the last ten years, the fact that NIPPV is able to improve gas exchange by avoiding endotracheal intubation and its complications and associated morbidity (increased risk of ventilator-associated pneumonia, ventilator-induced lung injury, increased need of sedation, prolonged ventilation, complications of upper airways, and mortality)and it is the most attractive aspect in both general and respiratory intensive care units and in the respiratory ward ***(Maleh et al., 2016; Cavalleri et al., 2018).***

Aim of the Work

Noninvasive positive pressure mechanical ventilation (NIPPMV) is beneficial for patients with respiratory failure (RF) when added to medical treatment. However, its role as an alternative to conventional mechanical ventilation (CMV) remains controversial.

Our aim is to compare the efficacy and resource consumption of NIPPMV against CMV in patients with Respiratory failure.

Chapter 1
Respiratory Failure

Definition

Respiratory failure is a clinical condition that happens when the respiratory system fails to maintain its main function which is gas exchange, in which PaO2 is lower than 60 mmHg and/or PaCO2 is higher than 45mmHg ***(Fazekas et al., 2018).***

Respiratory failure is a syndrome of inadequate gas exchange due to dysfunction of one or more essential components of the respiratory system:

- Chest wall (including pleura and diaphragm)
- Airways
- Alveolar-capillary units
- Pulmonary circulation
- Nerves
- CNS or Brain Stem

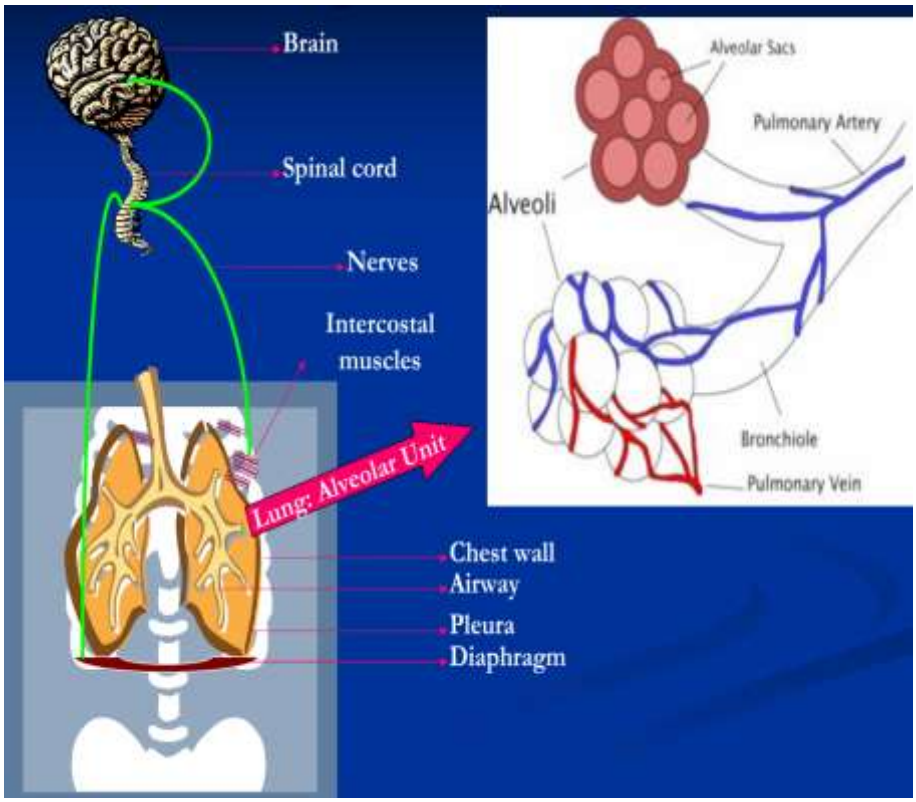

Figure (1): Cross section of lung alveoli ***(Fazekas et al., 2018).***

Epidemiology

The overall frequency of respiratory failure is not well known as respiratory failure is a syndrome rather than a single disease process. But incidence is about 360,000 cases per year worldwide, 36% die during hospitalization, morbidity and mortality rates increase with age and presence of comorbidities ***(Rochwerg et al., 2017).***