

## **Post Partum Respiratory Failure**

An essay submitted for partial fulfillment of master degree in critical care

By

### Mohammed Abd elmonaam Elsafty

M.B.B.CH. Faculty of Medicine Al-Azhar University

#### Under supervision of

### Prof. Dr. Mohsen Mohammed kotb

Professor of Anesthesia and Intensive Care Faculty of Medicine - Ain Shams University

### **Dr.Ahmed Mohammed Shafik**

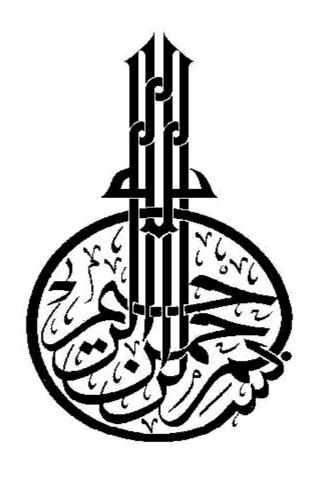
Assistant Professor of Anesthesia and Intensive Care Faculty of Medicine - Ain Shams University

## Dr. Hany Victor Zaki

Lecturer of Anesthesia and Intensive Care Faculty of Medicine - Ain Shams University

Faculty of medicine Ain Shams University

(2014)



﴿ قَالُواْ سُبْحَننَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَمْ لَنَا إِلَّا مَا عَلَمْ تَنا اللَّهُ الْحَكِيمُ اللَّهُ الْحَكِيمُ النَّا الْحَلِيمُ الْحَلْمُ الْحَلِيمُ الْحَلْمُ الْحَلِيمُ الْحَلْمُ الْحَلْمُ

صدق الله العظيم

(سورة البقرة ، الآية ٣٢)

# Acknowledgement

First of all, my deep great indebtness is to **ALLAH**, the most merciful and the most generous who greatly helps me. Thanks to **ALLAH**, I would never finish this work without **ALLAH** help or blessing.

I acknowledge my deep indebtness and great thanks and gratitude to *Prof.Dr. Mohsen Mohammed Kotb*, Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for his great support, excellent advices, appreciated cooperation and continuous encouragement to me. No words could express my feeling of great admiration and sincere appreciation to hem for his generous efforts and his humanity. My great thanks to hem for everything he taught me during the work.

I am also grateful to *Dr. Ahmed Mohammed shafik*, Assistant Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for his kind supervision, objective criticism, valuable efforts and sincere advices.

I deeply appreciate the help of *Dr. Hany Victor Zaki*, *Lecturer of Anesthesia and Intensive Care*, *Faculty of Medicine*, *Ain Shams University*, for his marvelous support, kind assistance and for providing me all facilities to do practical part of the work.

Finally, I offer my regards and blessings to all of those who supported me in any respect during the completion of this work.

Mohammed Abd elmonaam Elsafty 2014

## **List of Contents**

Subject	Page
Introduction	1
Aim of the work	4
Physiological changes occurring during Pregnancy	5
affecting on respiration.	
Patho physiology of causes of post partum respiratory	23
failure.	
Causes of post partum respiratory failure.	51
1) Acute pulmonary oedema	51
A) Increased alveolocapillary	
permeability pulmonary oedema.	54
I) Aspiration of gastric contents.	57
II) Amniotic fluid embolism.	58
III) Venous air embolism.	60
IV) Pneumonia during pregnancy.	60
V) Transfusion Related Acute Lung Injury	65
B) Increased hydrostatic pressure	
pulmonary oedema	69
I) Valvular heart disease.	73
II) Peripartum cardiomyopathy.	76
III) Myocardial infarction.	77
C) Pulmonary oedema due to severe	78
pre-eclampsia.	70
D) Pulmonary oedema associated with	
tocolytic therapy.	81
2) Acute asthma during pregnancy.	82
3) Venous thromboembolism during	02
pregnancy.	84

Subject	Page
Management of post partum respiratory failure.	87
Summary	133
References	136
Arabic Summary	1

### List of table

Table	Content	Page
1	Summary of cardiovascular changes in pregnancy	17
2	Astate of hypercoagulability exist in pregnancy, with increased levels of most coagulation factors	19
3	Difference in MAC requirements among non pregnant and pregnant.	22
4	Recommended Criteria for Acute Lung Injury (ALI) and Acute Respiratory Distress Syndrome (ARDS).	25
5	Risk factors for the development of acute pulmonary oedem in pregnancy	52
6	Mechanisms of pulmonary edema	53
7	Causes of adult respiratory distress syndrome in pregnancy	57
8	The relationship between ejection fraction and cardiac output	71
9	New York Heart Association (NYHA) functional classification system.	72
10	Maternal risk associated with pregnancy.	73
11	Factors that differentiate mild from severe pre eclampsia	81
12	Criteria for the Diagnosis of Respiratory Failure	88
13	Treatment of systolic heart failure	120
14	Athma treatment in pregnancy	122
15	Clinical symptoms and signs of lower extremity deep venous thrombosis.	123
16	Clinical symptoms and signs associated with pulmonary thromboembolism.	124
17	Commonly used laboratory and radiographic techniques for assisting in the diagnosis of pulmonary embolism.	126
18	The distinguishing pharmacologic features of standard (unfractionated) heparin and low molecular weight heparin (L -heparin).	130
19	Maternal and fetal side effects of warfarin therapy during Pregnancy.	131
20	The distinguishing pharmacologic features of heparin and warfarin.	132

## List of figure

Figure	Content	Page
1	Changes in the outline of the heart, lungs, and thoracic cage	7
	that occur in pregnancy.	
2	Pulmonary volumes and capacities in the non pregnant state	9
	and in the gravida at term.	
3	Cyclical changes in maternal transcutaneous PO2 as a result	10
	of hypoventilation between uterine contractions.	
4	Diagram of the caval venous system and its connections	15
	with the vertebral and azygous systems.	
5	Early stage of acute respiratory distress syndrome showing	28
	interstitial changes and patchy infiltrates.	
6	Late stage of acute respiratory distress syndrome showing	28
	bilateral and diffuse alveolar and reticular opacification.	
7	Lung autopsy specimen showing the exudative stage of	30
	acute respiratory distress syndrome.	
8	Lung autopsy specimen showing fibro proliferative stage of	30
	acute respiratory distress syndrome.	
9	Mechanisms Important in the Resolution of Acute Lung	31
	Injury and the Acute Respiratory Distress Syndrome.	

### **List of Abbreviations**

AFE	Amniotic Fluid Embolism
ALI	Acute Lung Injury
APTT	Activated Partial Thrpmboplastin Time
ARDS	Acute Respiratory Distress Syndrome
BRM	Biological Response Modifiers
BNP	Brain Natriuretic Peptide
CI	Cardiac Index
CMV	Controlled Mandatory Ventilation
CNS	Central Nervouse System
COP	Cardiac Out Put
COPD	Chronic Obstructive Pulmonary Disease
CPAP	Continuous Positive Airway Pressure
CT	Computerized Tomography
CVP	Central Venous Pressure
CVC	Central Venous Catheter
CXR	Chest X Ray
DIC	Disseminated Intravascular Coagulation
DSA	Diastolic Arterial Pressure
DVT	Deep Vein Thrombosis
ECG	Electro Cardio Gram
ECMO	Extra Corporeal Membrane Oxygenator
FACTT	Fluid and Catheter Treatment Trial
FEV1	Forced Expiratory Volume in the first second
FRC	Functional Residual Capacity
HDL	High- Density Lipoprotein
HIV	Human Immunodeficiency Virus

IMV	Invasive Mechanical Ventilation
ICU	Intensive Care Unit
INR	International Normalized Ratio
IVC	Inferior Vena Cava
LDL	Low Density Lipoprotein
LES	Lower Esophageal Sphincter
LMWH	Low Molecular Weight Heparin
MAC	Minimum Alveolar Concentration
MIF	Maximal Inspiratory Force
MRSA	Methicillin Resistance Staph Aureuse
NIH	National Institution Health
NIPPV	Non Invasive Positive - Pressure Ventilation
NO	Nitric Oxide
NYHA	New York Heart Association
PAC	Pulmonary Artery Catheter
PAOP	Pulmonary Artery Occlusion Pressure
PAWP	Pulmonary Artery Wedge Pressure
PcWP	Pulmonary capillary Wedge Pressure
PE	Pulmonary Embolism
PEEP	Positive End Expiratory Pressure
PVR	Peripheral Vascular Resistance
RDS	Respiratory Distress Syndrome
RT-PCR	Reverse Transcription- Polymerase Chain Reaction
RIDT	Rapid Influenza Diagnostic Antigen Test
SAP	Systolic Arterial Pressure
SARS	Sever Acute Respiratory Syndrome
SIMV	Synchronized Intermittent Mandatory Ventilation Pressure
TACO	Transfusion Associated Circulatory Overload

TRALI	Transfusion Related Acute Lung Injury
UFH	Un Fractionated Heparin
UK	United Kingdom
USA	United States of America
Vd	Dead Space
VILI	Ventilator Induced Lung Injury
Vt	Tidal Volume
VTE	Venous Thrombo Embolism
WHO	World Health Organization