Analysis Of The Outcome Measures Of High Frequency Oscillatory Ventilation (HFOV) In Critically Ill Children With Acute Lung Injury (ALI) And Acute Respiratory Distress Syndrome (ARDS) In Critically Ill Infants And Children.

Thesis

Submitted For Partial Fulfillment Of The Master Degree In Pediatrics

By

Doaa Mohammad Farrag Hamed

M. B., B. Ch.

Supervisors

Prof. Dr. Mahmoud Tarek Abd El- Monim.

Professor of Pediatrics
Faculty of medicine – Ain Shams University

Dr.Mervat Gamal Eldin Mansour

Assistant professor of Pediatrics
Faculty of medicine – Ain Shams University

Prof. Dr.Maha Mohamed El Gaafary

professor of public health
Faculty of medicine – Ain Shams University

Faculty of medicine
Ain Shams University
Cairo 2013

قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا

إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة البقرة آية٣٢

Acknowledgment

First and foremost, thanks to ALLAH, the most merciful, for achieving any work in my life.

I would like to express my great appreciation to Prof. Dr. Mahmoud Tarek Abd El- Monim. Professor of Pediatrics, Faculty of Medicine, Ain Shams University; for his sincere effort and valuable advice. His time and supreme effort are clear in every part of this work. Many thanks & gratitude for him.

I am deeply grateful to Dr.Mervat Gamal Eldin Mansour , Assistant professor of Pediatrics , Faculty of Medicine, Ain Shams University, who devoted her time, effort and experience to facilitate the production of this work.

I wish to introduce my deep respect and thanks to Prof. Dr. Maha Mohamed El Gaafary , Professor of public health , Faculty of medicine , Ain Shams University , for her kind care and great assistance throughout this work.

Finally, my sincere appreciation for my family for their support and encouragement.

Doaa mohammed Farrag

Contents

List of Abbreviations

ABG	Arterial Blood Gases.
AECC	American–European Consensus conference.
ALI	Acute lung injury**.**
APRV	Airway Pressure Release Ventilation.
ARDS	Acute Respiratory Distress Syndrome.
ARF	Acute Respiratory Failure.
BE	Base Excess.
BiPAP	Biphasic Airway Pressure.
CBC	Complete Blood Count.
CDP	Continuous Distending Pressure.
CI	confidence interval.
CMV	Conventional Mechanical Ventilation.
CO2	Carbon dioxide.
CPAP	continuous positive airway pressure.
CRP	C- Reactive Protein.
CV	conventional ventilation.
CXR	chest x ray.
DAD	Diffuse Alveolar Disease.
DIC	Disseminated Intravascular Coagulation.
DLO2	The diffusing capacity for O2.
dP	amplitude.

ECM	Extra-Cellular Matrix.
ECMO	Extracorporeal membrane oxygenation.
EIT	Electrical Impedance Tomography.
EPCs	Endothelial progenitor cells.
ERV	Expiratory Reserve Volume.
ET	endotracheal tube.
F	oscillatory frequency.
FiO_2	Fraction of inspired oxygen.
FRC	Functional Residual Capacity.
HCO_3	bicarbonate.
HFFI	High Frequency Flow Interrupter.
HFJV	High Frequency Jet Ventilation.
HFNC	High Frequency Non Conventional ventilation.
HFOV	High-Frequency Oscillatory Ventilation.
HFPPV	High-Frequency Positive Pressure Ventilation.
HFV	High-Frequency Ventilation.
HMGB	High-Mobility-Group B.
IC	inspiratory capacity.
ICU	Intensive Care Unit.
IL-1, IL-6, IL-8-10	interleukin 1,6,8,10.
INO	Inhaled Nitric Oxide.
INR	international normalized ratio.
IQR	inter quartile range.
IRV	Inverse Ratio Ventilation.

LPV	Lung Protective Ventilation.
MAP	mean airway pressure.
MIF	Macrophage migration inhibitory factor.
mPaw	mean airway pressure.
MRSA	Methicillin resistant staph aureus.
MSOF	Multi-System Organ Failure.
MV	Mechanical Ventilation.
NFkB	nuclear factor k -light-chain-enhancer of activated lymphocytes.
NICU	Neonatal Intensive Care Unit.
NIV	Non Invasive Ventilation.
NS	Non Significant.
OI	oxygenation index.
OR	odds ratio.
$PaCO_2$	Partial pressure of arterial Carbon dioxide.
PAF	Platelet Activating Factor.
PAI-1	Plasminogen Activator Inhibitor 1.
PaO_2	partial pressure of arterial oxygen.
PC-IRV	Pressure controlled Inverse Ratio Ventilation.
PEEP	Positive End-Expiratory Pressure.
PELOD	Pediatric Logistic Organ Dysfunction.
PFC	perfluorocarbon.
PICU	Pediatric Intensive Care Unit.
PIP	Peak Inspiratory Pressure.

PLV	partial liquid ventilation.
PMN	polymorph nuclear neutrophils.
ppm	part per million.
PRISM	Pediatric Risk of Mortality.
PRVC	Pressure Regulated Volume Contolled mode.
PSV	Pressure Support Ventilation.
$PtCO_2$	Transcutaneous CO_2
RAGE	Receptor for Advanced Glycation.
RCT	Randomized Controlled Trial.
RM	Recruitment Maneuver.
RR	relative risk.
RV	Residual Volume.
SAD	Small Airway Disease.
SaO_2	O_2 saturation .
SD	Standard Deviation.
SGOT	serum glutamic oxal acetic transaminase.
SIMV	Synchronized intermittent mandatory ventilation.
SP-B	surfactant protein B.
SPSS	Statistical Program for Social Science.
TGFb	Transforming Growth Factor b.
TLC	Total Lung Capacity.
TNFa	Tumour Necrosis Factor a.
TV	Tidal Volume.
USA	United States of America.

$V^{\cdot}CO_2$	CO_2 clearance.
V_A/Q	ventilation perfusion ratio.
VAP	ventilator associated pneumonia.
VC	Vital Capacity.
VEGF	Vascular Endothelial Growth Factor.
VFDs	Ventilator Free Days.
VILI	Ventilator Induced Lung Injury.
WBCS	White Blood Cells.
WMD	weighted mean difference.
WOB	Work of Breathing.

List of Figures

List of Tables