THE EFFECT OF THE CROSS CLAMP TIME ON THE POST OPERATIVE VENTILATION AND INOTROPIC SUPPORT IN POST CABG PATIENTS

Thesis Submitted in complete fulfillment of

The master Degree (M.Sc.) in

Cardiothoracic surgery

By

AHMED SULTAN MOHAMED SULTAN

(M.B., B.Ch.)

Under supervision of

Prof. Dr. WALEED GAMAL ABO SENNA

Professor of Cardiothoracic Surgery,

Faculty of Medicine, Cairo University

Prof. DR. MOHAMED IBRAHIM SEWIELAM

Professor of Cardiothoracic Surgery

Faculty of Medicine, Cairo University

DR. TAREK MOHAMED KANDEEL

Lecturer of Cardiothoracic Surgery

Faculty of Medicine, Cairo University

2014

بسم الله الرحمن الرحيم

ACKNOWLEDGEMENT

First and foremost thanks to GOD the most kind, beneficial and merciful

I would like to express my sincere appreciation and performed thanks to Prof. Dr. ***Waleed Gamal Abo Senna,*** *Professor of CardioThoracic Surgery, Faculty of Medicine, Cairo University, for his great effort, productive guidance, and valuable instructions.*

I would like to extend my deepest thanks and feelings of respect and gratitude to Prof. Dr. ***Mohamed Ibrahim Sewielam****, Professor of Cardiothoracic Surgery, Faculty of Medicine, Cairo University, for his assistance and innovative ideas and his scientific support.*

A word of appreciation is to DR. ***Tarek Mohamed Kandeel,*** *lecturer of Cardiothoracic Surgery, Faculty of Medicine, Cairo University, for his continuous support and invaluable effort. He helped me immensely during the preparation of this work.*

Finally, most thanks to my Father, Mother, my Wife and my Sister who supported me during preparation of this work.

Ahmed Sultan Mohamed

April 2014

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

- ABG: Arterial Blood Gas.
- AF: Atrial Fibrillation.
- BMI: Body Mass Index.
- CCS: Canadian Cardiovascular Society.
- CK: Creatine Kinase.
- CMV: Continuous Mandatory Ventilation.
- COPD: Chronic Obstructive Pulmonary Disease.
- CPAP: Continuous Positive Airway Pressure.
- CPB: Cardio Pulmonary Bypass.
- CVA: Cerebro Vascular Accident.
- EF: Ejection Fraction.
- FTE: Failure To Extubate.
- IABP: Intra-Aortic Balloon Pump.
- ICU: Intensive Care Unit.
- IMV: Intermittent Mechanical Ventilation.
- LOS: Length Of Stay.
- MEq: Mille Equivalent.
- O.M: Obtuse Marginal.
- P: Probability.
- PEEP: Positive End Expiratory Pressure.
- PMV: Prolonged Mechanical Ventilation.
- PSV: Pressure Support Ventilation.
- R: Pearson correlation test.
- SD: Standard Deviation.
- SVR: Systemic Vascular Resistance.
- VAP: Ventilator Associated Pneumonia.
- XCL: Cross clamp time.

ABSTRACT

Background: Coronary artery bypass grafting using cardio pulmonary bypass is a successful procedure in modern medicine, however prolonged aortic cross clamp time is linked to adverse outcome following cardiac surgery.

During aortic cross clamping, a period of global myocardial ischemia is followed by reperfusion injury that manifests as myocardial stunning, arrhythmia and changes in cardiac performance that needs inotropic support in early post-operative period, also associated with acute lung injury that needs mechanical ventilation of different duration.

Objectives: To assess the effect of the aortic cross clamp time on the mechanical ventilation and inotropic support post-operatively.

Patient and methods: Thirty elective patients of isolated ischemic heart disease undergoing on pump CABG collected from Cardio Thoracic Surgery department Elkasr Alainy Hospital. We assessed the post-operative ventilation time and inotropic support of those patients post-operatively.

Results :Statistical analysis showed , when the mean time of the cross clamp was(±73minutes) there was no usage of postoperative inotropes and the mechanical ventilation time was only up to one day in twenty five patients (83.33%) ,but with increased the time of the cross clamp , when the mean time was (±135 minutes) the usage of post-operative inotropes was mandatory in three patients (10%) and the post-operative ventilation was up to three days in four patients about (16%).

Conclusion: Prolonged aortic cross clamp time correlates with post-operative morbidity and mortality studies to decrease this morbid effect are warranted.

Key words:

Coronary Artery Bypass Grafting.

Cross clamp time.

Mechanical ventilation.

Inotropic support.

INTRODUCTION

(CABG) is among the most important surgical procedures in the history of medicine. Arguably, no other operation has prolonged more lives, provided more symptom relief, and been more thoroughly studied **(Vincent et al., 2010).**

Despite the belief that the need for CPB would be significantly diminished because of the surge in interest in off-pump coronary artery bypass grafting (CABG), the predictions have not materialized, and most institutions have reduced their use of off-pump CABG to only 10% to 15% of cases **(Guru et al., 2007).**

Moreover, the ability of the heart to assume normal electromechanical function adequate to support the systemic circulation must rapidly follow the ischemic interval. The need for inotropic support or mechanical support devices (e.g., intra-aortic balloon assist device, ventricular assist device) to wean the patient from cardiopulmonary bypass when support was not required preoperatively represents a failure of myocardial protection **(Levitsky et al., 2010).**

The systemic inflammatory response to CPB and surgical trauma may contribute to worsen cardio circulatory disturbances. Long-term use of certain drugs (e.g., angiotensin-converting enzyme inhibitors, calcium-channel antagonists, and heparin), patients co-morbidities (e.g., heart failure, diabetes mellitus) and procedure-related factors (e.g., prolonged CPB, residual hypothermia) have been identified as predictors of norepinephrine-resistant vasoplegia that has been associated with mortality rates as high as 25% when vasoplegia persisted for more than 36 h **(Warren et al., 2009)**.

AIM OF WORK

The overall aim of this thesis is to find out the correlation between prolonged cardiopulmonary bypass and cross clamping time, on one hand, and the post-operative mechanical ventilation time as well as the need for inotropic support on the other hand, in low risk ischemic heart patients undergoing on pump coronary artery bypass grafting.