



# ***Morbidity, mortality and management of acute mitral regurgitation with pregnancy***

***An Essay***

*Submitted for partial fulfillment of  
Master degree in Intensive Care*

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**2016**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا  
إلا ما علمتنا إنك أنت  
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

# Acknowledgment

*First and foremost, I feel always indebted to **ALLAH**, the Most Kind and Most Merciful.*

*I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Nehal Gamal El-Deen Nouh**, Professor of Anesthesia and Intensive Care - Faculty of Medicine- Ain Shams University for her keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

*I am also delighted to express my deepest gratitude and thanks to **Prof. Dr. Sahar Mohammed Kamal**, Professor of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

*I am deeply thankful to **Dr. Eman Aboubakr Bayoumi**, Lecturer of Anesthesia and Intensive Care, Faculty of Medicine, Ain Shams University, for her great help, active participation and guidance.*

*I would like to express my hearty thanks to all my family for their support till this work was completed.*

*Last but not least my sincere thanks and appreciation to all patients participated in this study.*

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# List of Abbreviations

Abb.	Full term
<b>ACC</b>	American College of Cardiology.
<b>AHA</b>	American Heart Association.
<b>ANP</b>	Atrial Natriuretic Peptide.
<b>AR</b>	Aortic Regurgitation.
<b>AS</b>	Aortic Stenosis.
<b>AV</b>	Atrioventricular.
<b>BNP</b>	Brain Natriuretic Peptide.
<b>CABG</b>	Coronary Artery Bypass Grafting.
<b>CO</b>	Cardiac Output.
<b>CVD</b>	Cardiovascular Disease.
<b>CW</b>	Cardiac Wave.
<b>EACTS</b>	European Association for Cardio-Thoracic Surgery.
<b>ECG</b>	ElectroCardioGram
<b>ERO</b>	Effective Regurgitation Orifice.
<b>EROA</b>	Effective Regurgitation Orifice Area.



<b>ESC</b>	European Society of Cardiology.
<b>EVEREST</b>	Endovascular Valve Edge to Edge Repair Study.
<b>FDA</b>	Food and Drug Administration.
<b>HCM</b>	Hypertrophic Cardiomyopathy.
<b>HR</b>	Heart Rate.
<b>IE</b>	Infective Endocarditis.
<b>LA</b>	Left Atrium.
<b>LAD</b>	Left Anterior Descending.
<b>LCA</b>	Left Coronary Artery.
<b>LCX</b>	Left Circumflex Artery.
<b>LV</b>	Left Ventricle.
<b>LVD</b>	Left Ventricle Dimension.
<b>LVEF</b>	Left Ventricular Ejection Fraction.
<b>LVESD</b>	Left Ventricular End Systolic Dimension.
<b>MIDA</b>	Mitral regurgitation International Database.
<b>MR</b>	Mitral Regurgitation.
<b>MVO2</b>	Myocardial Oxygen Consumption.
<b>MVP</b>	Mitral Valve Prolapse.
<b>NYHA</b>	New York Heart Association.
<b>OM</b>	Obtuse Marginal.
<b>PGI2</b>	Prostaglandin 2 (Prostacyclin).
<b>PISA</b>	Proximal Isovelocity Surface Area.
<b>RA</b>	Right Atrium.
<b>RCA</b>	Right Coronary Artery.
<b>RVD</b>	Right Ventricular Diastolic Dimension.

<b>SD</b>	Standard Deviation.
<b>SV</b>	Stroke Volume.
<b>TEE</b>	Transesophageal Echocardiography.
<b>TR</b>	Tricuspid Regurgitation.
<b>TTE</b>	Transthoracic Echocardiography.
<b>TVI</b>	Time Velocity Integral.
<b>VCF</b>	Velocity of Circumferential Fiber Shortening.
<b>3D</b>	Three Dimensional.



# Introduction

# INTRODUCTION

**T**he structural interrelationship of the valves of the heart and the dynamic mechanisms involved in their function are fundamental in optimizing valve performance and are dependent upon an intricate, multifaceted central cardiac complex. Each valve within this complex is best considered as a “Functional Unit” built in the fibrous skeleton of the heart, and any interruption of the relationships within this Functional Unit potentially results in valvular dysfunction (*Caulfield et al., 1990*).

The degree of hemodynamic deterioration in acute MR depends upon the etiology and degree of MR, which is often dramatic and rapid in onset. An important factor is left atrial compliance, which is usually normal unless the acute regurgitation is superimposed upon chronic MR (*Bursi et al, 2005*).

During pregnancy, there is a fall in systemic (peripheral) vascular resistance beginning in week 5 of gestation with a nadir between weeks 20 and 32. After week 32 of gestation, the systemic vascular resistance slowly increases until term. There is a corresponding initial decrease in the systemic arterial pressure, which begins in the first trimester and reaches its nadir at mid-pregnancy. Thereafter, systemic pressure begins to increase again and ultimately reaches or exceeds the pre-pregnancy level. The overall fall in systemic vascular resistance is a result of changes in resistance and flow in multiple vascular beds (*Clark et al., 2006*).

Valvular heart disease in pregnancy is relatively infrequent, with an incidence of less than 1% (*Siu et al, 1997*). In the developed world, valvular disease in women of childbearing age is often congenitally acquired (*Soler-Soler and Galve, 2000*). Rheumatic heart disease, myxomatous degeneration, previous endocarditis, and bicuspid aortic valves

are also encountered. Pregnancy complicated by valvular heart disease tends to have a favorable prognosis if risks are appropriately managed. Management of the pregnant woman with a heart condition requires special expertise, and patients with high-risk conditions should be referred to centers specialized in their care (*Windram and Colman, 2014*). Mitral regurgitation in pregnancy is usually due to mitral valve prolapse or rheumatic heart disease (*Lesniak-Sobelga et al., 2004*). It is usually well tolerated during pregnancy due to the decrease in systemic vascular resistance. Asymptomatic patients do not require specific therapy during pregnancy. In the presence of symptomatic left ventricular dysfunction with hemodynamic abnormalities, diuretics, digoxin, hydralazine, and nitrates can be administered. Surgery for mitral valve repair or replacement during pregnancy has been associated with a high incidence of fetal loss and should be considered only in patients with severe symptoms not controlled by medical therapy (*Hameed et al., 2000*).

## **AIM OF THE WORK**

***T***he aim of this work is to facilitate safe and effective management of the patient with acute mitral regurgitation with pregnancy and reduce the incidence of adverse outcomes and mortality.



# Chapter 1

## Anatomy of the heart