

## Introduction

Maternal heart disease complicates between 1% to 4% of pregnancies and accounts for up to 15% of maternal deaths, which is higher than average compared to the general population. While leading causes of maternal mortality such as hemorrhage and infection are declining, mortality due to maternal heart disease is increasing and in developed countries, heart disease is now the leading cause of maternal mortality.

The risk of complications in pregnancy depends on the underlying cardiovascular disease, ventricular function, functional class, valvular function, presence of cyanosis, pulmonary artery pressures, and other factors.

Disease-specific risk should be assessed using the modified World Health Organization (mWHO) classification in all patients with cardiovascular diseases of childbearing age and before conception.

A multidisciplinary cardio-obstetrics team should ensure appropriate monitoring during pregnancy in all patients with cardiovascular diseases, plan for labor and delivery, and ensure close follow-up throughout pregnancy and postpartum period to improve maternal and foetal outcomes

## Aim of the Work

The aim of the study was to identify clinical characteristics and disease-specific outcomes in pregnant women with structural heart disease and to risk stratify these women.

## Patients and Methods

**Patients:** This is an observational prospective study that included 130 pregnant females with structural heart disease presented to the pregnancy heart clinic at Alexandria university from November 1, 2021 till October 30, 2022.

**Inclusion criteria:** pregnant women with structural heart disease – Age > 18years.

**Exclusion criteria:** pregnant women with mechanical prosthesis.

### Methods:

1. Demographic and clinical characteristics of study population throughout pregnancy and until first month postpartum.
2. Obstetric history and evaluation of current pregnancy.
3. Current pregnancy outcome (Hospital admissions and main reasons for admission, Cardiovascular mortality ,Obstetric outcome, Fetal and neonatal outcome)
4. Electrocardiogram .
5. Transthoracic echocardiography.

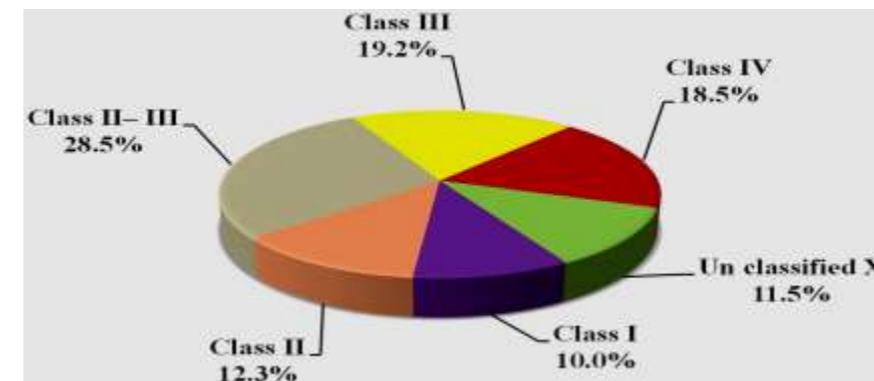
## Results

The mean age of all enrolled patients was  $30.73 \pm 6.96$  years. The most frequent cardiovascular diseases were valvular heart diseases (47.7%). Most of the patients were in classes II-III of the m WHO classification (28.5%). Ten patients who had AF during our study, received anticoagulation.

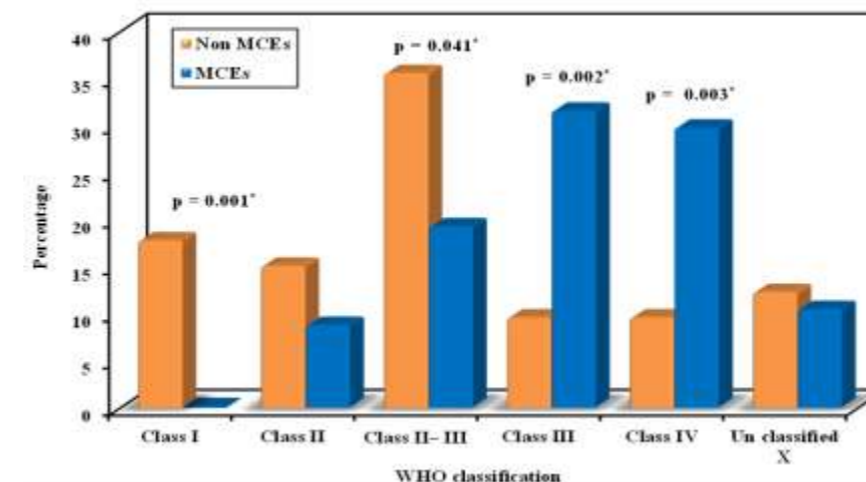
The cardio-obstetric team decided to terminate pregnancy in seven cases (5.4%). Three patients died during pregnancy (2.3%) because of cardiovascular disease. The most frequent cause of adverse outcomes in our study was congestive heart failure, followed by arrhythmias. Maternal cardiac events ( MCEs) occurred in 57 cases .

The results of the univariate regression analysis show that several variables were significantly associated with MCEs during pregnancy .specifically, WHO functional classification >II, LV EF <45%, mitral valve regurgitation, Tricuspid valve regurgitation, and atrial fibrillation on ECG with P values (0.003,0.007,0.005,0.009,0.033) respectively.

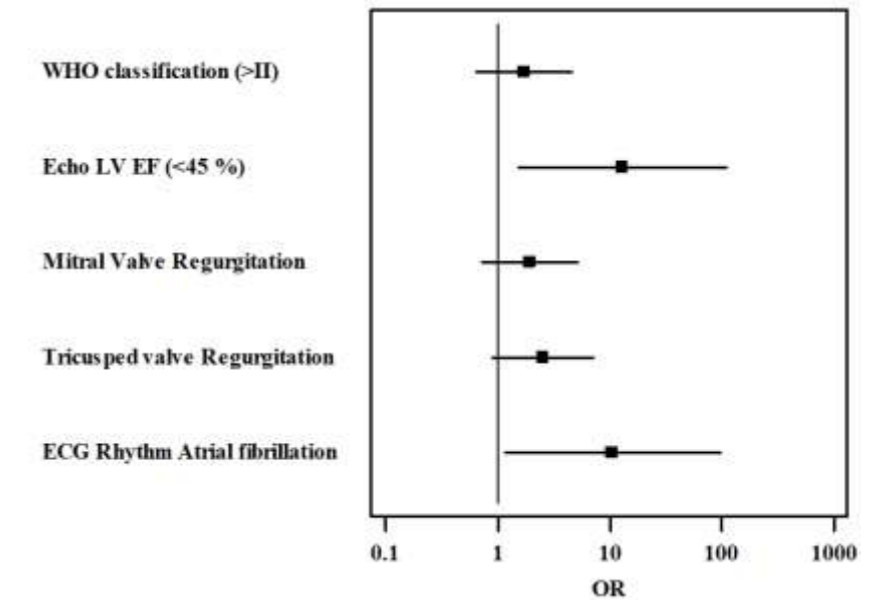
By multivariate regression analysis, only LV EF <45 % and atrial fibrillation were independent predictors of MCEs during pregnancy with statistically significant P values (0.019, 0.037) respectively. One hundred and three cases (79.2%) were delivered by cesarean section and two patients (1.5%) had preterm labor. Fetal mortality occurred in two cases (1.5%). Neonatal mortality occurred in two cases (1.5%).



**Figure 1:** Distribution of the studied cases according to WHO classification



**Figure 2:** Relation between Non-MCEs and MCEs with WHO classification



**Figure 3:** Multivariate logistic regression analysis to detect the most independent predictors of MCEs

## Conclusion

- Cardiovascular diseases in pregnancy have an adverse impact on maternal morbidity and mortality. Patients with CMP and PAH are at particularly high risk, while pregnant women with simple congenital heart disease have relatively good outcomes.
- Heart failure and arrhythmias particularly AF are common and serious cardiac complications in women with structural heart diseases during pregnancy.
- Left ventricular systolic dysfunction (LVEF <45%) and arrhythmia (atrial fibrillation) are independent predictors of maternal cardiac events (MCEs).