

# **PATTERN OF ARRHYTHMIA IN PATIENTS WITH HEART DISEASE DURING PREGNANCY**

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## **Abstract**

the overall frequency of any arrhythmia is about 68/100000 pregnancy related hospitalizations between 2000 and 2012 with an increase in its frequency between 2000 and 2012 by 58% being 55/100000 pregnancy related hospitalizations in 2000 and 83/100000 pregnancy related hospitalizations in 2012, this increase was mainly due to the increase in AF frequency by 111% and VT frequency by 127% between 2000 and 2012.

## **Keywords**

Arrhythmias, Heart diseases, pattern.

### **I- Introduction:**

The most common cardiac complication during pregnancy is arrhythmia affecting women with or without structural heart disease (SHD) (Vaidya et al., 2017), however they are more common in women with structural heart disease particularly congenital heart disease (CHD) than women with structurally normal heart. (Manolis et al, 2020).

### **II- Pattern of arrhythmia:**

#### **1. Supraventricular arrhythmias (SVT, AF & atrial flutter):**

A population-based study in 2016 reported that atrial fibrillation (AF) or atrial flutter occurred in 157 pregnancies out of 264730 pregnancies. (Lee. et al, 2016).

According to the more recent (Vaidya et al, 2017) large analysis of pregnancy related hospitalization which enrolled 57315593 pregnancy related hospitalizations from January 2000 to December 2012 the overall frequency of AF was 27/100000 pregnancy related hospitalizations with 111% increase in its frequency between 2000 and 2012 (18/100000 in 2000 to 35/100000 in 2012), followed by SVT which has an overall frequency 22/100000 pregnancy related hospitalizations and remained somewhat stable over time with only 12% increase between 2000 & 2012. The overall frequency of atrial flutter was 4/100000 pregnancy related hospitalizations.

Physiological changes of pregnancy facilitate the occurrence of AF with or without structural heart disease however prevalence of AF in patients with structural heart disease is higher than in patients without structural heart disease. (Cumyn et al, 2017). As regard which period of pregnancy has the highest risk of developing AF, (Salam et al, 2015) concluded that the 2<sup>nd</sup> trimester showed the highest incidence of AF in pregnant women with structural heart disease.

A meta-analysis of 7 cohort studies (301638 patients were included) showed that incidence of AF was 2.2% in pregnant women with structural heart disease and 0.3% in pregnant women without structural heart disease. (Chokesuwattananaskul et al, 2019).

#### **2. Ectopic beats (APCs & PVCs):**

Ectopic beats are common during pregnancy and usually benign particularly if infrequent or associated with no symptoms. (Knotts et al, 2014).

#### **3. Ventricular arrhythmias:**

Ventricular arrhythmias include benign ones as premature ventricular contractions (PVCs), they are like premature atrial contractions (PACs) both of them are benign and non-life threatening particularly if asymptomatic. (Priori et al, 2015).

Monomorphic ventricular tachycardia (VT) can present itself for the first time during pregnancy even in pregnant women with structurally normal hearts, it is also called idiopathic VT, usually originating from the right ventricular outflow tract (RVOT) and seldomly from the left ventricular outflow tract (LVOT), increased level of catecholamine was associated with idiopathic VT in these patients. (Priori et al, 2015).

Sustained ventricular tachycardia (VT) and ventricular fibrillation (VF) are uncommon during pregnancy, out of 2966 patients 1.4% had sustained VT/VF, most of this percentage was among cardiomyopathic patients, patients with structural heart disease, or patients with past history of arrhythmia. (Ertekin et al, 2016).

Vaidya et al, 2017 in his large study estimated frequency of VT by 16/100000 PRG while VF was 2/100000 PRH.

**Maternal age:**

As regard age group, according to (Vaidya et al, 2017) there was a concordant relationship between age and frequency of arrhythmia, the highest frequency of any arrhythmia was in women between 41 and 50 years old, and advanced maternal age was associated with increased risk of arrhythmia.

**Arrhythmia and structural heart disease:**

**Cardiomyopathy (CM):** ventricular arrhythmias can happen with many types of cardiomyopathies such as dilated cardiomyopathy (DCM), hypertrophic cardiomyopathy (HCM) and arrhythmogenic right ventricular dysplasia (ARVD). (Goland et la, 2017).

Peripartum cardiomyopathy (PPCM) should be suspected in women with new onset VT if occurred in the last trimester of pregnancy or in postpartum period particularly in black women, women with advanced maternal age, women with multiple pregnancies, or women with history of pre-eclampsia. (Sliwa et al, 2017), (Honigberg et al, 2019).

In a study included 9841 patients diagnosed of PPCM, 18.7% had arrhythmia, the commonest type was VT with 4.2%. (Mallikethi-Reddy et al, 2017). Hypertrophic cardiomyopathy (HCM): A worldwide registry of 60 pregnant women diagnosed with HCM showed that 11.7% of them had arrhythmia, 10% was ventricular tachyarrhythmia (VTA) and 1.7% of them had AF. (Goland et al, 2017).

**Arrhythmogenic right ventricular dysplasia (ARVD):** 9-13% of pregnant women with ARVD had ventricular arrhythmias. (Gandjbakhch et al, 2018).

**Congenital heart disease (CHD):** patients with CHD have relatively higher risk of developing VT. (4.5-15.9/100000 pregnancies), also patients with repaired CHD have a higher risk of developing VT than healthy ones, 14% of patients with repaired CHD had non-sustained VT, the highest percentage was among patients with surgically corrected tetralogy of fallot (TOF). (Niwa et al, 2007).

**Syncope:**

Syncope is defined as sudden complete, transient loss of consciousness followed by spontaneous recovery, one of its causes is cardiac syncope due to either mechanical or arrhythmogenic causes. In a recent retrospective study, prevalence of syncope among pregnant women was around 1% (4667/481930 pregnancies), 32.3% of them had syncope in 1<sup>st</sup> trimester, 44.1% in 2<sup>nd</sup> trimester & 23.6% in 3<sup>rd</sup> trimester. (Chatur et al, 2019).

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