

# A Sentinel Case of Maternal Atrial Fibrillation during Active Labor

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## Background

- Rising trend in arrhythmias:** From 2000-2012, pregnancy-related hospitalizations with arrhythmias increased 58%, primarily due to increases in atrial fibrillation (AF, 94%) and ventricular tachycardia (VT, 110%).<sup>1</sup>

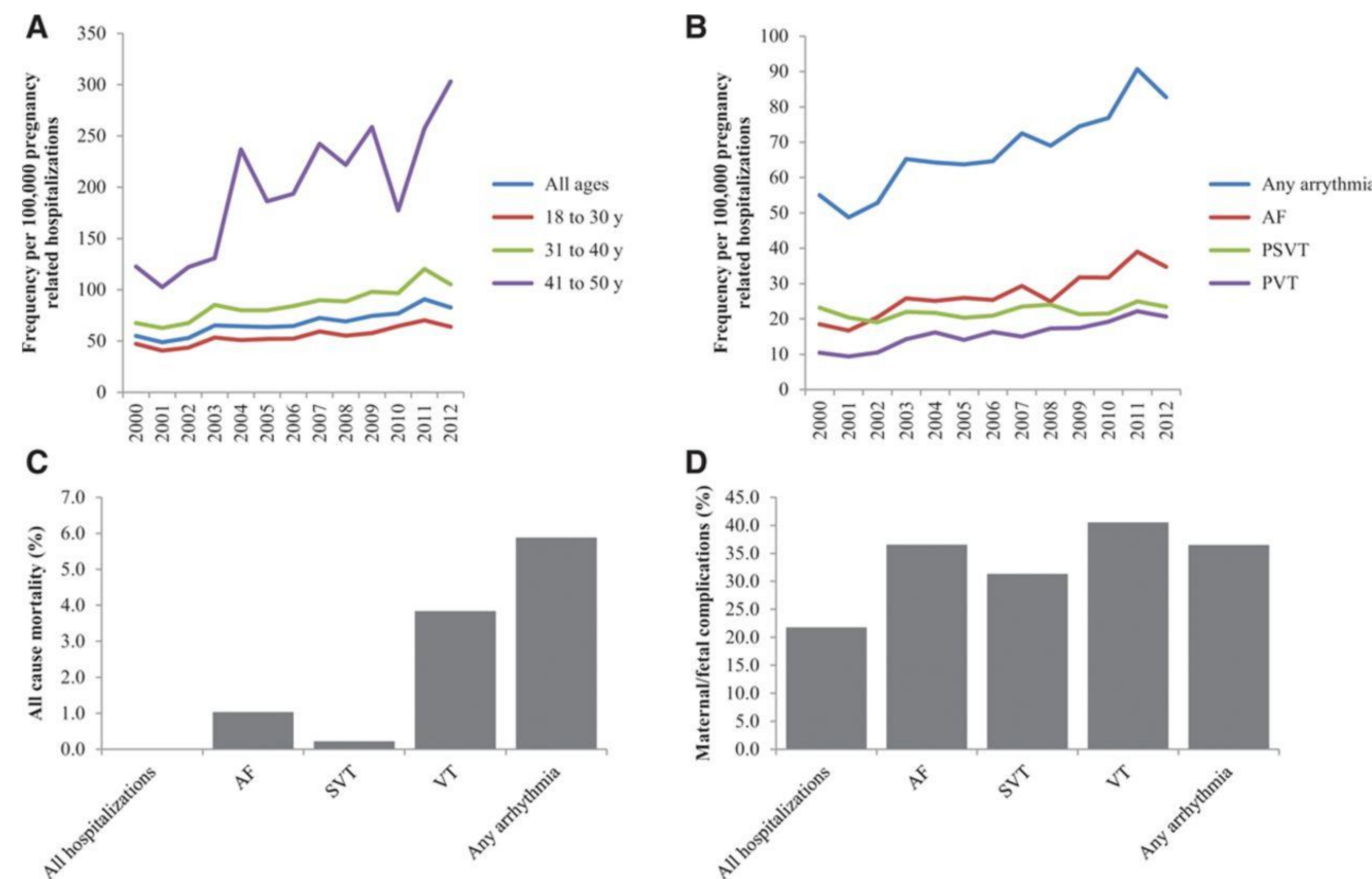


Figure 1. Prevalence of pregnancy-related arrhythmias, associated mortality, and maternal/fetal complications.<sup>1</sup>

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- AF during active labor:** There is limited published data due to the rare incidence. Most episodes of AF occur during third trimester.<sup>2</sup>
- Physiologic basis of increased arrhythmia risk in pregnancy:** Increased sympathetic activity, positive chronotropic effects of relaxin, intravascular volume expansion, increased atrial stretch.<sup>3</sup>
- Risk factors:** Pre-existing AF, obesity, advanced maternal age, structural heart disease, cardiovascular comorbidities, African American race, lower socioeconomic status.<sup>1-4</sup>
- Complications:** Preeclampsia, stroke, heart failure, decreased uteroplacental perfusion, fetal distress, preterm birth, NICU admission.<sup>3</sup>

## Objective

This case report aims to highlight important considerations in the management of AF during active labor, including acute management of a patient with no prior history of cardiac arrhythmias.

## Initial Presentation

A 32-year-old female, G3P2003 at 39 weeks, 1-day EGA who presented to our labor and delivery unit for a scheduled induction of labor. The pregnancy was complicated by chronic hypertension without antihypertensive medication, sickle cell trait (carrier of alpha and beta thalassemia), pre-diabetes with a hemoglobin A1c of 5.9% and a pre-pregnancy BMI of 33. The patient passed her 1-hour GCT during pregnancy. The fetus had pyelectasis due to known "horseshoe" kidney. The patient was being managed by an outside high-risk OB clinic.

## Active Labor

At the time of admission, the patient had a pulse of 86 bpm and blood pressure of 117/81. The initial fetal heart tracing had heart rate in the 130bpm range, moderate variability, accelerations noted. During an assessment of vital signs and patient condition at 5 cm dilation, the patient was noted to have tachycardia in the 120 bpm range. The patient denied chest pain, shortness of breath, or palpitations. EKG was notable for atrial fibrillation with rapid ventricular response (AF with RVR), premature ventricular contractions, and tachycardia of 110-120 bpm. After consulting with cardiology, diltiazem IV was administered with no immediate improvement. Cardiology considered the AF with RVR to be stress-induced.

During the second stage of labor, the fetal heart tracing deteriorated with recurrent variable decelerations noted despite amnioinfusion and maternal position changes. A low forceps-assisted vaginal delivery was performed, with Apgar scores of 8/9 and a neonatal weight of 2760 g.

## Postpartum

Two hours postpartum, a MET call was activated for persistent AF with RVR with a maternal heart rate of 160 beats per minute. The patient was treated with metoprolol, diltiazem, and flecainide, ultimately converting to sinus rhythm. Echocardiogram demonstrated normal cardiac valvular anatomy and function with an ejection fraction of 65%. On postpartum day two, patient remained clinically stable with a normal sinus rhythm. The patient was discharged with prescriptions for diltiazem 120 mg once daily and flecainide 150 mg every 12 hours.

## Discussion

### AF in pregnancy

- AF is the most common arrhythmia during pregnancy (27 per 100,000 pregnancy) typically seen with pre-existing AF, obesity, or structural heart disease.<sup>1-3</sup>
- Our patient had new-onset AF during active labor. Notable risk factors were BMI of 33 and unmedicated chronic hypertension.

### Clinical Management

- Acute stabilization and rate control:** Beta-blockers and digoxin are first-line agents while calcium-channel blockers are second-line. If hemodynamically unstable or poor rate control, perform direct-current cardioversion within 48 hours and is safe throughout pregnancy.<sup>3,4</sup>

## Discussion (continued)

- Diagnostic evaluation:** New-onset AF should be worked-up with echocardiogram and screen for reversible causes (thyroid disease, electrolyte derangement, pulmonary embolism, alcohol use).<sup>3</sup>
- Rhythm control:** To prevent recurrent AF, consider flecainide and sotalol. Reserve catheter ablation for refractory, symptomatic cases though ideally delayed until postpartum.<sup>2,3</sup>
- Anticoagulation:** If thromboembolic risk, low-molecular weight heparin is preferred. Patients with mitral stenosis should be fully coagulated.<sup>3</sup>
- Breastfeeding counseling:** Review medications that may be unsafe during breastfeeding, such as diltiazem, mexiletine, verapamil, and procainamide.<sup>3</sup>

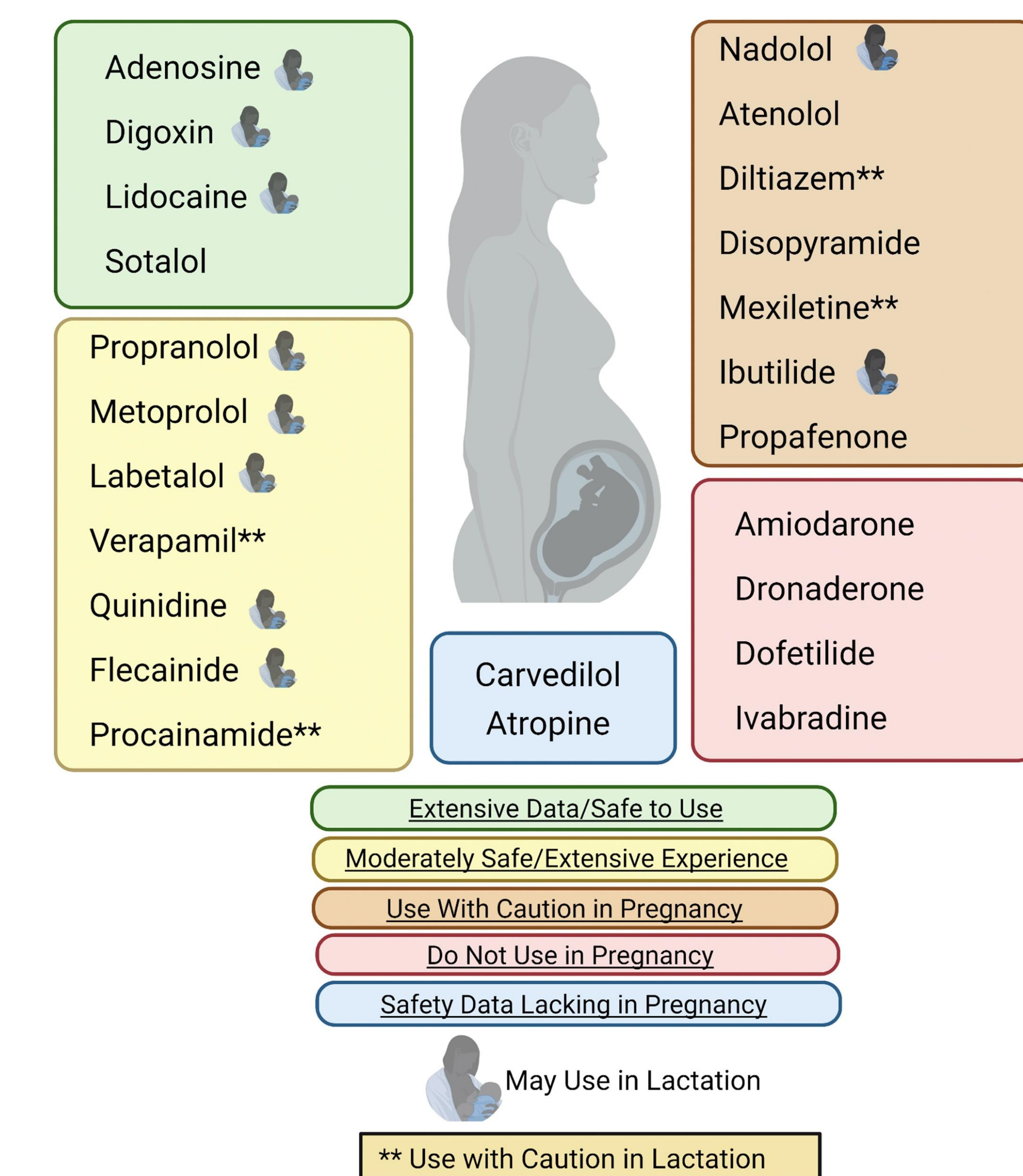


Figure 2. Medication safety profiles for management of arrhythmias in pregnancy.<sup>3</sup>

<https://doi.org/10.1016/j.jacep.2021.10.004>

## Conclusion

This case demonstrates the importance of prompt treatment and collaborative care for AF with RVR in pregnancy especially in complicated pregnancies at risk for maternal and fetal hemodynamic instability. As arrhythmias become increasingly more prevalent in the obstetric population, early diagnosis and interdisciplinary care are crucial for reducing perinatal morbidity and mortality.

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