Atrial fibrillation during pregnancy: cardioversion with flecainide

Introduction

Atrial fibrillation of new onset during pregnancy is rare, but when it occurs can pose a difficult dilemma to the clinician regarding the most appropriate choice of treatment. Chemical cardioversion, electrical cardioversion and rate-control therapy are all potential options and are selected on an individual patient basis. This article discusses a 38-year-old woman with no previous cardiac history who presented with new onset atrial fibrillation at 27 weeks pregnant. She was chemically cardioverted with intravenous flecainide and maintained sinus rhythm throughout the remainder of pregnancy. She delivered at 40 weeks term without complication and there was no evidence of congenital abnormality post delivery. To the authors' knowledge this is the first report of the use of flecainide for chemical cardioversion of new onset atrial fibrillation during pregnancy.

Discussion

Atrial fibrillation during pregnancy is rare (prevalence <0.1%) but may become more common if women start to become pregnant at a later age. It is almost always the result of an underlying secondary cause such as congenital heart disease or alcohol excess (Mendelsohn, 1956). In this case no secondary cause was apparent. Guidelines from the American College of Cardiology, the American Heart Association and the European Society of Cardiology (Wann et al, 2011) recommend the following treatments for atrial fibrillation in pregnancy:

Class I recommendation

- Digoxin, a beta-blocker, or a non-dihydropyridine calcium-channel antagonist are recommended to control the ventricular rate in pregnant patients with atrial fibrillation
- Direct current cardioversion is recommended in pregnant patients who become haemodynamically unstable as a result of atrial fibrillation.

Class IIb recommendation

- Administration of quinidine or procainamide may be considered to achieve pharmacological cardioversion in haemodynamically stable patients who develop atrial fibrillation during pregnancy.

Beta-blockers have been used extensively in pregnancy. Non-cardioselective beta-blockers such as propanolol have demonstrated reduced umbilical blood flow and evidence of intrauterine growth restriction (Mitani et al, 1987). Cardioselective agents such as metoprolol and atenolol are preferred given their reduced effects on the peripheral nervous system. Verapamil can cause maternal and fetal bradycardia, heart block and reduced uterine contractility

Figure 1. Electrocardiogram on admission showing atrial fibrillation with fast ventricular response.

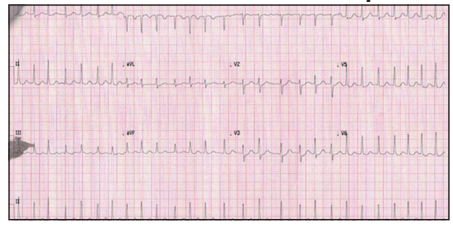
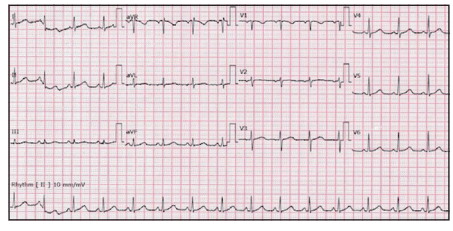


Figure 2. Electrocardiogram post cardioversion with flecainide.



Case Report

A 38-year-old pregnant woman was admitted with acute onset of palpitations and light-headedness. The episode occurred at 11.00 am while she was sitting at work. There was no history of chest pain or dyspnoea. She reported seven previous episodes of palpitations up to 5 minutes' duration during this pregnancy.

She was in the 27th week of her second pregnancy. There was no prior cardiac illness nor significant family history. She did not smoke nor consume alcohol. Her previous pregnancy was uneventful.

On arrival her heart rate was 160 beats per minute, blood pressure was 134/78 mmHg, oxygen saturations were 99% on room air, and respiratory rate was 18 breaths per minute.

An electrocardiogram showed an irregular narrow-complex tachycardia at 160 bpm, consistent with atrial fibrillation (*Figure 1*). Thyroid function was normal. An echocardiogram showed a structurally normal heart with normal systolic function.

Examination by the obstetric consultant did not reveal any problems related to her pregnancy and cardiotocography was normal. Direct current cardioversion was discussed with the patient, but there were concerns about the potential for inducing premature labour.

The drug of choice for non-pregnant patients is flecainide. The authors could find no reports of adverse effects or teratogenic effects related to its use in pregnancy. She received intravenous flecainide 1.5 mg/kg (120 mg) and she reverted to sinus rhythm within 90 minutes. She was commenced on oral metoprolol and subcutaneous enoxaparin. A repeat electrocardiogram showed sinus rhythm with no evidence of ventricular pre-excitation and a normal QTc interval (*Figure 2*). She was discharged the following day.

She continued on oral metoprolol 50 mg twice daily and subcutaneous enoxaparin throughout the remainder of pregnancy without further atrial fibrillation. Enoxaparin was discontinued 1 week before delivery and she delivered without complication at 40 weeks term. There was no evidence of congenital abnormality.

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while diltiazem use during the first trimester has also been linked to possible congenital malformations at birth (Rubin et al, 1984; Kleinman et al, 1985).

Direct current cardioversion has been widely reported in multiple case reports and case series, but there are no prospective data on its safety. A review of the published case reports looked at 44 cases of direct current cardioversion in pregnancy (overall success 93.2%) (Tromp et al, 2011). There were two maternal deaths (neither attributed to direct current cardio-version). Two cases of fetal distress were reported following direct current cardioversion resulting in immediate caesarean section, one resulting from a hypertonic uterus. In both cases the neonates was delivered safely, but there is a general consensus that direct current cardioversion should only be performed when facilities are available for continuous fetal monitoring and emergency caesarean section (Barnes et al, 2002).

Quinidine and procainamide have no known teratogenic effects. Quinidine has the longest history of use in pregnancy but there are reported side effects of mild uterine contractions, premature labour and neonatal thrombocytopenia, and at toxic doses spontaneous abortion and 8th cranial nerve injury have been seen (Chow et al, 1988).

Amiodarone is associated with multiple adverse effects to the fetus including fetal hypothyroidism, low birthweight and intrauterine growth restriction, prematurity, bradycardia and QT prolongation, and is therefore contraindicated during pregnancy apart from in life-threatening situations (Widerhorn et al, 1991).

Flecainide is less well established during pregnancy and case reports of its use are few. Wagner et al (1990) described a patient treated with flecainide 100 mg twice daily for paroxysmal ventricular tachycardia and polymorphic ventricular ectopy throughout the entire duration of pregnancy. No adverse effects were reported and no teratogenic effects were seen. Caution needs to be applied when using flecainide following the increased mortality observed in patients with myocardial infarction in the Cardiac Arrhythmias Suppression Trial (CAST) (Echt et al, 1991). The authors believe that this is the first report of the successful use of intravenous flecainide for chemical cardioversion in a pregnant women with atrial fibrillation. **BJHM**

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LEARNING POINTS

- New onset atrial fibrillation during pregnancy is rare, and often the result of a secondary cause.
- Chemical cardioversion with flecainide is a treatment option in appropriate patients.
- The method of choice for cardioversion during pregnancy is specific to each patient and determined on a case-by-case basis.