



Cardioversion in pregnancy – Lessons for the anaesthetist



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Introduction

- Cardiac disease remains the leading cause of maternal mortality in the UK according to the MBRRACE-UK 2022 report.
- Arrhythmias in pregnancy contributed to 18% of maternal cardiovascular deaths in the triennia 2018 to 2020.
- Delays in cardioversion have been highlighted as contributing factors to maternal deaths. [1]

Methods

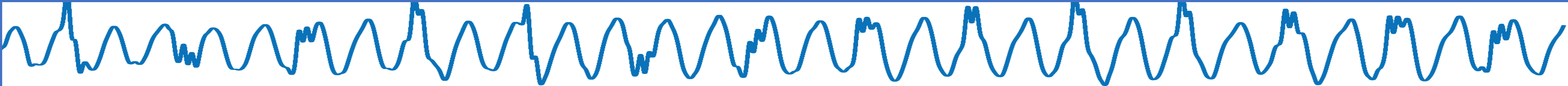
- The cardiac and obstetric outcomes of patients who underwent cardioversion in our tertiary maternity unit over a seven-year period between 2015 and 2022 were reviewed.
- We aimed to highlight the incidence of cardioversion in pregnancy, identify the most common arrhythmias requiring cardioversion and the maternal characteristics of these patients.

Results

Patient	1	2	3 (Two episodes of cardioversions)	4
Age (years)	26	29	23	34
Body-mass index (kg/m2)	22	34	23	22
Ethnicity	White other	White British	Asian Pakistani	Asian Pakistani
Gestation at cardioversion	38 weeks (ante partum)	30 weeks (3 shocks failed, ante partum)	16 and 18 weeks (ante partum)	27 weeks (post partum)
Cardiac rhythm during cardioversion	Supraventricular tachycardia (SVT) to ventricular tachycardia	SVT and Atrial Fibrillation (AF)	SVT	AF
Maternal heart rate or range/ min	165	160	200 – 240	110 – 150
Time from diagnosis to cardioversion	3 hours	5 hours	2 hours and 3 hours	48 hours
Location of cardioversion	Obstetric theatre	Cardiac catheter lab	Accident and emergency	Obstetric theatre
Anaesthesia details	General anaesthetic	General anaesthetic	Sedation (both episodes)	General anaesthetic
Energy for cardioversion (Joules)	200 J	150 – 200 – 200 J	100 J (both episodes)	120 J
Structural heart disease	Mild mitral regurgitation	Ejection fraction 35 – 40%	None	None
Gestation at delivery	38 weeks	37 weeks	39 weeks	27 weeks

- Over the study period, 60603 deliveries were reported.
- Five cardioversions in four pregnant patients were recorded with an incidence of 1:15000.

- All the patients presented with palpitations and all had pharmacological management initiated prior to cardioversion.
- The mean time from diagnosis to administration of the first shock was 12 hours.
- Four of the five episodes terminated after a single biphasic shock.
- One patient was refractory to cardioversion and required cardiac ablation.
- Good maternal and neonatal outcomes were recorded with most delivering at term.
- One patient (25%) who had foetal monitoring in place during and after the cardioversion experienced foetal bradycardia requiring an emergency caesarean delivery. Neonate was admitted to neonatal intensive care following delivery but was safely discharged.



Discussion

- Cardioversion for an arrhythmia in pregnancy is rare, performed in a variety of settings and mostly reported in the 2nd or 3rd trimester in our case series. Haemodynamically unstable SVT and AF were the most common arrhythmias needing cardioversion.
- It requires prompt multidisciplinary input from the anaesthetic, obstetric and cardiology team.
- Initial management in a pregnant patient should be in line with the resuscitation guidelines including history, examination, 12- lead ECG, blood gas analysis, electrolyte correction, left lateral tilt, antacid prophylaxis and fluid resuscitation.
- Most patients respond to synchronised DC shock, cases refractory to cardioversion may require ablation therapy as we observed.
- Both sedation and a GA can be administered, but the decision is best individualised.
- Specific anaesthetic risks include: aspiration, difficult airway, worsening of haemodynamic status and providing anaesthesia in a remote site.
- Cardioversion should ideally be performed in a location with facilities immediately available for both difficult airway management and caesarean birth. Vasopressors should be available to support blood pressure.
- Therapeutic anticoagulation, with transoesophageal echocardiogram if available, need to be considered in pregnant patients that present with haemodynamically unstable AF of greater than 36 hours duration. [2]
- Foetal monitoring as per patients gestational-age may be considered during and after cardioversion but its unavailability should not delay performing the cardioversion.
- Following cardioversion, it is necessary to monitor patients closely in a monitored environment, an echocardiogram performed to rule out structural heart disease and appropriate follow-up arranged after discharge.

Conclusion

- Cardioversion in pregnancy is rare, should not be delayed and maternity units should develop multidisciplinary processes to ensure pregnant individuals receive the same standard of care as their non-pregnant counterparts.

References

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