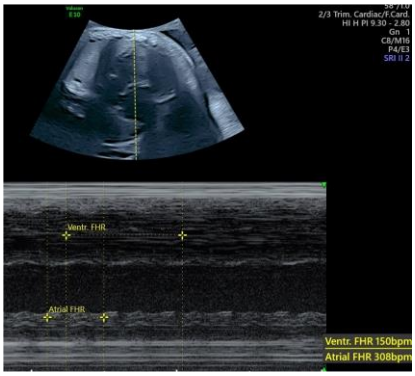
Lethal hypoxic ischaemic encephalopathy at term after transplacental flecainide treatment of fetal atrial flutter. Estimating serious outcomes other than hydrops

. Elizabeth McCarthy, Mercy Hospital for Women, Heidelberg, Australia. RANZCOG ASM, Perth Oct-23

Emccarthy@mercy.com.au



Background

Fetal tachycardia often triggers Perinatal Medicine referral. In 4 ½ years, our unit saw 64 women (109 ultrasound scans)

- ¼ PACs*, ½ ST*, ¼ supraventricular tachycardia (SVT) or atrial flutter (AF)
- 6 women received transplacental antiarrhythmic treatment

We present the saddest case, the only case where the baby died, to try to learn from this tragedy.

Aims Estimate likelihoods of
1. Hypoxic ischaemic encephalopathy (HIE)
2. Cardiac rhythm change
… after fetal SVT/AF

Case: Flecainide started at 36/40 for fetal AF, Aims
(i) rhythm reversion
(ii) greater newborn maturity
(iii) better chance of normal birth [1].

Serial ultrasound showed
- ventricular slowing - 190 to 135 bpm
- persisting atrial flutter (300 bpm)
- No Hydrops.

Birth
- 18 hours of reduced fetal movements (RFM)
- CTG uninterpretable 12 hours pre-birth
- Caesarean section in daylight hours

Newborn
- 4.9 kg @ 38+0 weeks
- cord arterial pH 6.9, HIE, poor ventricular contractility, ***heart rate 115, sinus rhythm (SR)***, no hydrops.

Care was redirected to palliative goals. The baby died aged 2 days.

Discussion

HIE after SVT/AF is rare ~ 2%, especially if no fetal growth restriction (FGR), prematurity, difficult birth.
- France - 6/69 (9%) deaths: HIE in 1 FGR fetus [2].
- North America -12/159 (7.5%) deaths: 1 "encephalopathy", 1 "asphyxia" [1].

SVT/AF can change rhythm:
- Benign (SR): vagal - cord compression, cool air France 3/16 [2], USA 14/38 [1].
- Malignant rhythms: ventricular arrhythmias, hypotension, sudden death. Newborns with SVT: 2% die, 18% severe morbidity (USA) [3].

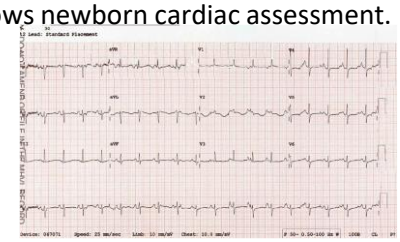
Ultrasound and SVT

- Hydrops = well-seen
- SR and SVT= well-seen
- Malignant rhythms can be subtle +/- transient e.g. ventricular tachyarrhythmias,
- Hypotension = not detectable, inferred from organ damage, not readily detectable on antenatal ultrasound.

RFM can mean
(a) Fetal compensation – e.g. to placental disease or
(b) Fetal decompensation – e.g. after brain injury.

Plausibly, unwitnessed malignant arrhythmia caused hypotensive brain injury/RFM despite absence of hydrops

Recommendations:
- Ventricular rate control + no hydrops ≠ uncomplicated fetal/newborn course
- Consider that severe arrhythmia & hypotension can evolve in any case of fetal AF/SVT.
- Birth allows newborn cardiac assessment.



- Weigh expediting birth against known risks:

(a) early term compared with term birth [4]
(b) Night-time versus daytime birth [5], and
(c) that expediting birth after RFM does not predictably save babies' lives if damage has already been done [6].

References: 1. Jaeggi ET, et al. Circulation. 2011;124(16):1747-54; **2.** Bartin R, et al. Heart Rhythm O2. 2021;2(2):160-7. **3.** Chu PY, et al. Early Hum Dev. 2015;91(6):345-50. **4.** https://www.pretermalliance.com.au/Our-Research/Breakthrough-Collaborative **5.** Wu YW, et al. Am J Obstet Gynecol. 2011 Jan;204(1):37.e1-6. **6.** Norman JE, AFFIRM investigators. Lancet. 2018 Nov 3;392(10158):1629-1638. doi: 10.1016/S0140-6736(18)31543-5. Epub 2018 Sep 27. Erratum in: Lancet. 2020 Oct 24;396(10259):1334. *

* **Abbreviations:** PACs =premature atrial ectopic beats; ST = sinus tachycardia