

Indication Specific Diagnostic Yield of Fetal Echocardiography



Germanakis I. (1), Bagaki A. (1), Matalliotakis I. (2), Makrigiannakis A.(2)
 Pediatric Cardiology Unit, Dpt of Pediatrics (1),
 Dpt of Obstetrics and Gynecology (2) University Hospital Heraklion,
 Faculty of Medicine, University of Crete, Greece



Introduction. To document the indication specific diagnostic yield of fetal echocardiography, when performed by established referral indications..

Methods

- **Retrospective study** based on referral indications and documented findings of fetal echocardiograms performed over 6 years (1997-2013) in an academic referral center for fetal cardiology.
- **Referral indications** have been classified as either **supported** by recent literature (**Ind+**) or **not (Ind-)**. (**Ref**)
- Indication specific **diagnostic yields** and Odds Ratios (O.R) for **1) any abnormality** **2) fetal congenital heart disease (f.CHD)** and **3) critical f.CHD** when fetal echocardiography was applied in **Ind+** and **Ind-** pregnancies have been estimated.

Results

A. 1782 out of 1847 fetuses (1804 pregnancies) were included, having complete referral data.

915 (51.3%) corresponded to Ind+ cases, the remaining to Ind- cases.

- **Ind+ cases** had fetal (50.4%), familial (36.9%) or maternal (31%) origin of referral indication
- **Ind- cases** had either no referral indication (family or physician's wish for detailed imaging) (52%) or not established referral indications. **Fig 1.**

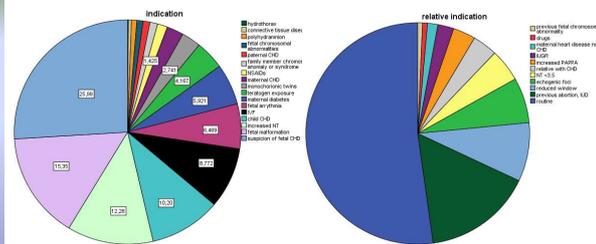


Fig 1. Referral indications for Ind (+) (left) and Ind (-) (right) cases

B. Diagnostic yield in the whole group for

- any abnormality 35.7%
- f.CHD 27.6%
- critical f.CHD 1.9%

fCHD diagnoses (in descending order)

- ventricular septal defects (38.6%)
- aortic coarctation, atrial septal defects (5-10% each)
- valvular stenosis, arch abnormalities, complex forms of CHD (<5% each)

C. Ind+ referrals were associated with increased risk.

(compared to Ind- referrals) for:

- 1) any abnormality** (46.1% vs 24.5%, **O.R: 2.6**, 2.1-3.2)
 - 2) f.CHD** (35.8% vs 18.9%, **O.R: 2.3**, 1.9-2.9)
 - 3) critical f.CHD** (3.2% vs 0.6%, **O.R:5.6**, 2.6-14.5)
- (Chi-square $p < 0.001$)

Fig 2

D. There was an indication-specific diagnostic yield

Diagnostic yield (%) for fCHD / critical CHD in Ind+ referrals:

Highest >50% for

- polyhydramnion (71/14)
- abnormal heart in anomaly scan (56/ 8)
- chromosomal abnormalities (62 /1)

Intermediate 25-50% for

- fetal malformations (39/3)
- Increased NT (36/1.8)
- maternal CHD (45 /4.5)

Low < 25% for

- IVF (21/1.3)
- maternal diabetes (18/1.9)
- Teratogen drug exposure (18/0)
- monozygotic twins (16/0)

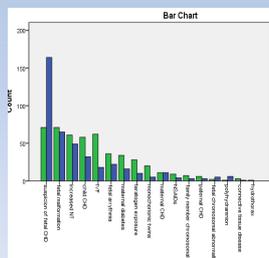


Fig 3. Indication-specific diagnostic yield

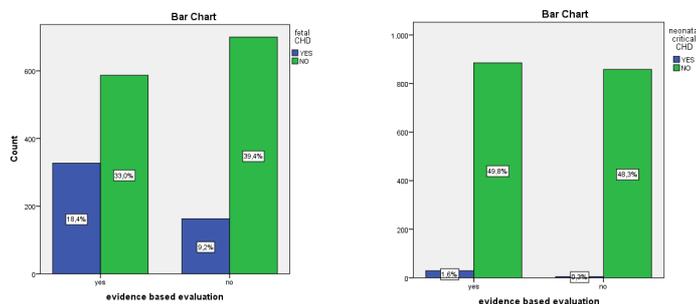


Fig 2. Increased evaluation relative risk for fCHD (left) and critical CHD (right) in cases having an established indication for fetal echocardiography.

Conclusions

Fetal echocardiography when performed under established indications is associated with significantly increased diagnostic yield for fetal CHD, which is referral indication specific. However, critical fetal CHD cases might still escape antenatal diagnosis in the absence of indication for fetal echocardiogram.