Fetal heart screening in low-risk pregnancies

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Fetal heart screening in low-risk pregnancies.

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised pregnant women who presented none of the risk features that are indications for fetal echocardiography.

Setting
Community and hospital. The economic study was conducted in Trieste, Italy.

Dates to which data relate
Effectiveness and resource data were collected in the period between 10 February 1986 and 31 July 1992. It is not clear to which year the costs related.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken on the same patient sample as that included in the effectiveness analysis. It was not clear whether costing was undertaken prospectively or retrospectively.

Study sample
7024 pregnant women were screened at 20-22 weeks; the screening was repeated at a more advanced gestational stage in 9% of cases. Cardiological follow-up was continued postnatally until 2 years of age. No power calculations were stated.

Study design
Longitudinal case series.
Analysis of effectiveness
The primary health outcomes assessed in the review were the overall prevalence of cardiac anomaly and the incidences of major and minor defects.

Effectiveness results
The overall prevalence of cardiac anomaly was 0.93%. The incidences of major and minor defects were 0.44% and 0.48%, respectively.

Clinical conclusions
A fetal heart screening programme in the obstetric population was justified. It defined a high-risk group for karyotyping, allowed planning and delivery in a tertiary centre, or the choice of terminating the pregnancy for the parents.

Measure of benefits used in the economic analysis
The benefits measured were the overall prevalence of cardiac anomaly and the incidences of major and minor defects.

Direct costs
Direct health service costs were considered: hospital costs, staff salaries, materials and depreciation in value of the high resolution ultrasound equipment. It appears that costs were not discounted.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
The accuracy of the echocardiographic screening was calculated for major, minor and all defects. Sensitivity, specificity, positive predictive value and negative predictive values were calculated, with and without the false negatives.

Estimated benefits used in the economic analysis
The overall prevalence of cardiac anomaly was 0.93%. The incidence of major defects was 0.44% and minor defects was 0.48%. There were 23 true positives (0.33%): in 20 cases, the diagnosis was made in the second trimester, and 13 women (65%) chose termination of pregnancy. Seventeen of the 20 cases identified in the second trimester were serious malformations. There were 42 false negatives (0.60%). Of these, 12 had signs of cardiac dysfunction at birth or within the 1st month of life, and three died as a result of their cardiac anomaly. There were eight false positives (0.11%), all of a minor type. Benefits were not discounted.

Cost results
The total cost of screening the 7024 pregnant women was $323,104. Consequently, the cost of each cardiopathy diagnosed correctly (i.e. the 23 true positives) was $14,048. The cost of each severe cardiopathy averted (13 terminations of pregnancy) was $24,854. Costs were not discounted.

Synthesis of costs and benefits
The authors implied that screening was a dominant strategy.

**Authors' conclusions**
A fetal heart screening programme in the obstetric population was justified. It defined a high-risk group for karyotyping, allowed planning and delivery in a tertiary centre, or the choice of terminating the pregnancy for the parents and appeared to have a positive cost-benefit ratio. A crucial factor was the level of training and experience of operators, who need specific teaching support.

**CRD Commentary**
The comparator chosen was no screening, which was reasonable. Effectiveness data were derived from a longitudinal case series study involving 7024 pregnant women. Besides the large number of subjects, sensitivity analyses also strengthened the validity of the effectiveness data. However, no statistical analysis and no power calculations were reported. Very little detail was provided on the derivation of costs which makes it difficult to judge the quality of the results. The authors emphasised the importance of cost consequences of no screening but they did not fully quantify these costs. The inclusion of the costs of the comparator strategy would make this economic evaluation complete and generalizable to other settings.

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