The Routine Antenatal Diagnostic Imaging with Ultrasound Study: another perspective

DeVore G R

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
Routine Antenatal Diagnostic Imaging with Ultrasound Study (RADIUS).

Type of intervention
Screening.

Economic study type
Cost-effectiveness analysis.

Study population
Women at the second trimester of pregnancy at low risk for fetal anomalies.

Setting
Tertiary and non tertiary centres. The economic study was carried out in the United States.

Dates to which data relate
Effectiveness data for the RADIUS and MSAFP screening were collected during 1987-1991 and 1986-1990 respectively. Nodate for the quantity of resources was specified. 1994 charges were used.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken on the same patient sample used in the effectiveness study. It is not clear if this was done prospectively or retrospectively.

Study sample
The RADIUS study performed 7281 diagnostic procedures (2568 and 4623 in tertiary and non-tertiary centres respectively). Within the MSAFP screening program, 1,057,941 procedures were performed.

Study design
Two retrospective case series were used to assess effectiveness for intervention and comparator respectively. The study was multicentre.
Analysis of effectiveness
The outcome was given by the detection rate of malformed fetuses. No evidence of comparability of the groups (e.g. in terms of age) was reported. However it was pointed out that the patients were at low risk for fetal anomalies.

Effectiveness results
The number of malformed fetuses identified by the RADIUS study at the second-trimester screening examination was 6.8 per 1000 at the tertiary centres and 1.7 per 1000 at the non-tertiary centers. The difference was statistically significant (P=.001; odds ratio 3.9; 95% CI 1.6-9.8). Overall, the tertiary and non-tertiary centres showed a second-trimester detection rate of 3.6 per 1000. In contrast, the detection rate of the MSAFP screening programme was 1.31 per 1000.

Measure of benefits used in the economic analysis
Detection rate of malformed fetuses.

Direct costs
Costs and quantities were not reported separately. Only costs to the provider organisation were included. MSAFP costs included genetic counselling, ultrasound examination, amniocentesis, amniotic fluid alpha-fetoprotein and karyotype. 1994 charges were used.

Currency
US dollars ($).

Sensitivity analysis
A threshold analysis was used to test variability in the detection rate and the cost per examination.

Estimated benefits used in the economic analysis
The number of malformed fetuses identified by the RADIUS study at the second-trimester screening examination was 6.8 per 1000 at the tertiary centres and 1.7 per 1000 at the non-tertiary centres. The difference was statistically significant (P=.001; odds ratio 3.9; 95% CI 1.6-9.8). Overall, the tertiary and non-tertiary centres showed a second-trimester detection rate of 3.6 per 1000. In contrast, the detection rate of the MSAFP screening programme was 1.31 per 1000.

Cost results
The average cost per test performed was $53 for MSAFP and $200 for RADIUS (tertiary and non-tertiary centres).

Synthesis of costs and benefits
The cost per detection of a malformed fetus was $40,338 for the MSAFP screening programme; $56,008 for the combined tertiary and non-tertiary centre ultrasound screening programmes. When the ultrasound was performed by tertiary centers, the cost per detected malformed fetus was $29,533, i.e. $10,805 less than MSAFP screening. When the screening ultrasound was performed by non-tertiary centres, the cost per detected fetus was $115,575, i.e. $75,237 more than MSAFP screening. The authors calculated that to maintain the cost per detected malformed fetus using ultrasound at a rate equal to or less than MSAFP screening, physician at the non-tertiary care centres should be reimbursed at a rate of $50 (or less) per examination.

Authors’ conclusions
The authors concluded that if physicians are reimbursed according to their diagnostic skills, the routine ultrasound
screening of low-risk patients would be cost-effective even if performed in non-tertiary care centres.

**CRD Commentary**
The author's suggestion to reduce the charges of performing diagnostic procedure according to the ability of the physician to detect abnormal fetuses in order to maintain the cost-effectiveness of screening programme performed in non-tertiary care centres is biasing. In fact, he should consider that when a clinician misses a correct diagnosis of fetuses with structural malformations, economic, social and legal implications are relevant, and should be included in the economic analysis. Alternatively, it should be concluded that the screening programmes should be only performed specialised centres with highly qualified clinicians, in order to offer any patients the same chance to undergone an effective procedure.

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