Respiratory outcomes in early childhood following antenatal vitamin C and E supplementation

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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.

CRD summary
This study assessed the cost and respiratory outcomes for infants whose mothers were at risk of pre-eclampsia and received high-dose vitamins C and E or placebo during pregnancy. The authors concluded that high-dose vitamins C and E supplementation during pregnancy was associated with increased health care use and costs, and did not improve infant respiratory outcome. The methods were appropriate, assuming that a new randomised controlled trial was not viable. The authors’ conclusions were appropriate for the evidence.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study assessed the cost and respiratory outcomes for infants whose mothers were at risk of pre-eclampsia and received high-dose vitamins C and E during pregnancy.

Interventions
The intervention was a daily dose of 1g of vitamin C and 400 international units of RRR-alpha-tocopherol (a form of vitamin E) for mothers during pregnancy, and this was compared with placebo.

Location/setting
UK/primary care.

Methods
Analytical approach:
The analysis was based on one two-year study. The authors did not state the perspective.

Effectiveness data:
The clinical outcome data were retrieved retrospectively two years after delivery, from mothers who had participated in a randomised controlled trial (RCT) of women receiving either vitamins C and E or placebo, during pregnancy. A sample of 643 women, with 330 in the intervention group and 313 in the placebo group, was considered for the respiratory outcomes; and a sample of 99 women, with 54 in the intervention group and 45 in the placebo group, was considered for the health care use data. The primary clinical outcomes were the occurrence of asthma, eczema, cough, or wheeze. Regression models were used to adjust for differences in baseline characteristics, and for twins and triplets.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The summary benefit measure was the proportion of infants with any symptoms of asthma, eczema, cough, or wheeze.

Cost data:
The cost categories were the medications, hospital in-patient and out-patient services, general practitioner (GP) and community practitioner visits, and the use of home oxygen. The resource use was from GP and hospital records. The costs were based on NHS tariffs and were reported in UK pounds sterling (£).
Analysis of uncertainty:
Confidence intervals around the outcomes were obtained from the regression models. A nonparametric bootstrap method was used for the economic data, which were not normally distributed.

Results
The total cost was £1,309 for the intervention and £785 for placebo; a difference of £524 (99% CI -132 to 1,352). Infants in the intervention group had 2.6 times (99% CI 0.8 to 5.1) more accident and emergency or out-patient visits and 3.2 times (99% CI 0.2 to 6.9) more GP visits than infants in the placebo group.

The differences in the proportions of infants with diagnosed asthma, eczema, cough, wheeze, or chest problems between the groups were not statistically significant.

Authors’ conclusions
The authors concluded that high-dose vitamins C and E supplementation during pregnancy was associated with increased health care use and costs, and did not improve infant respiratory outcome.

CRD commentary
Interventions:
The comparators were appropriately selected. The maternal intake of antioxidant supplementation was expected to improve infant respiratory morbidity.

Effectiveness/benefits:
The authors justified the retrospective nature of the study, because a new RCT in pregnant women would have been difficult to justify. The absolute number of mothers from each group who participated in this study was reported, but their percentages of the original participant groups were not, so it is unclear if there was an imbalance. The benefit measure was disease-specific, which might reduce the generalisability of the results, as they can only be compared with those of similar interventions.

Costs:
The perspective was not stated, but the cost categories appear to have been consistent with the viewpoint of the NHS. The resource use data were from the RCT and were relevant to the UK context. They were collected retrospectively and the sample was smaller than for the effectiveness data and similarly might have been unbalanced. The price year was not reported.

Analysis and results:
No synthesis of the health benefit and costs was conducted. In effect, a cost-consequences analysis was conducted. The results of the study were clearly reported. Regression models and nonparametric bootstrapping were appropriately used for the comparison of costs and health outcomes between the two groups.

Concluding remarks:
The methods were appropriate, assuming that a new RCT was not viable. The authors’ conclusions were appropriate for the evidence.

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