Burden of paediatric rotavirus gastroenteritis and potential benefits of a universal rotavirus vaccination programme with RotaTeq in France
Huet F, Largeron N, Trichard M, Miadi-Fargier H, Jasso-Mosqueda G

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 compared the impact of introducing a vaccination for rotavirus among children. The authors concluded that this would reduce rotavirus cases, health care use and deaths. Some analysis of uncertainty around the study findings was undertaken. The study methods appear satisfactory and well reported, although the cost results less so. The authors’ conclusion seems appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim of this study was to identify the health and cost benefits associated with vaccinating French infants against rotavirus gastroenteritis.

Interventions
The study considered the vaccination of infants at ages 2, 3 and 4 months with RotaTeq to protect against rotavirus gastroenteritis. This intervention was compared with no vaccination programme for rotavirus gastroenteritis.

Location/setting
France. Primary/secondary care.

Methods
Analytical approach:
A decision tree model was used to identify the impact of vaccination over a 5-year period. The model was used to combine data on incidence, vaccine efficacy and health care resource use from a number of sources in order to evaluate the health and cost implications of the vaccine programme. The authors indicate that the analysis was performed from a health care payer perspective and a societal perspective.

Effectiveness data:
The authors obtained the majority of model parameters from two published studies. REVEAL (Rotavirus gastroenteritis Epidemiology and Viral types in Europe Accounting for Losses in public health and society) is a multi-centre observational study and REST (Rotavirus Efficacy Safety Trial) is a large-scale (70,000 participants) clinical trial of the vaccine. However, the authors did not provide any details of their search methods or inclusion criteria. The clinical data included the sensitivity and specificity of the vaccine.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measures of health benefits used were the number of paediatric rotavirus gastroenteritis cases avoided, the number of general practitioner (GP) visits, emergency department visits and hospitalisations avoided, and the number of deaths avoided. Future benefits were discounted at a rate of 3% per annum.

Cost data:
The analysis included costs associated with the vaccination programme, GP visits, emergency department visits, hospitalisations and parental time off work. The health care payer perspective included the cost of health care reimbursed by the state, while the societal perspective included all direct and indirect costs. Health care costs and productivity costs due to parental time off work to look after sick children were taken from the literature, while the authors made assumptions about vaccination costs. The resource use data were taken from the REVEAL study which also provided some of the clinical data. Future costs were discounted at a rate of 3% per annum. The price year was not reported. The costs were reported in euros (EUR).

Analysis of uncertainty:
Uncertainty in the effectiveness estimates and price data used was examined using one-way sensitivity analyses. Ninety-five per cent confidence intervals were used where available; when this was not possible +/- 50% was used instead.

Results
The study estimated that vaccination would prevent 249,400 (-74%) cases of rotavirus, 25,661 (-77%) hospitalisations, 81,162 (-80%) emergency department visits, 39,913 (-72%) GP consultations and 11 (-79%) deaths.

The vaccination programme would cost from EUR 9.4 to 34.0 million from the societal perspective and from EUR 16.4 to 32.4 million from the health care provider perspective.

The total health care costs associated with RVGE were reduced by EUR 47 million from the National Healthcare Payer perspective and by EUR 88 million from a societal perspective.

Authors' conclusions
The authors concluded that the addition of a vaccination programme resulted in reductions in health care utilisation and parental days off work. They noted that these benefits are worth the additional costs associated with the vaccination programme.

CRD commentary
Interventions:
Although not explicitly stated, it appears that the authors have compared the introduction of the rotavirus vaccination programme with usual practice in their setting.

Effectiveness/benefits:
The effectiveness data were taken from two main published studies. The authors justified their choice but did not report the methods and inclusion criteria used to identify relevant studies. This makes it difficult to comment on whether the best evidence has been used. However, the paper provided some details of the study designs.

Costs:
This analysis was undertaken from two perspectives and it would appear that all appropriate costs have been included for each case. The methods used to identify the costs were described and were appropriate to the study population and setting. Future costs were appropriately discounted. No price year was reported, which will prevent any future reflation exercises.

Analysis and results:
Uncertainty in the clinical and cost data was considered in a number of one-way sensitivity analyses. This goes some way to assessing the impact of uncertainty and variability in the study data. However, multivariate or probabilistic analyses would have provided more robust results. The authors did not identify a primary health outcome, nor did they combine the cost and clinical data. The health benefit results of the study were reported clearly, but the cost results were not. It is not clear what the total vaccination programme cost was and what the total net benefit was.

Concluding remarks:
The study methods appear satisfactory and well reported, although the cost results less so. The authors' conclusion seems appropriate.
Funding
Sanofi Pasteur MSD.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
Child, Preschool; Cost of Illness; France /epidemiology; Gastroenteritis /economics /epidemiology /prevention & control; Humans; Infant; Infant, Newborn; Rotavirus Infections /economics /epidemiology /prevention & control; Rotavirus Vaccines /immunology; Vaccination

Accession Number
22007001701

Date bibliographic record published
06/09/2007

Date abstract record published
09/08/2008