Fosphenytoin: pharmacoeconomic implications of therapy
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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.

Health technology
Parenteral therapy for the control of acute seizures.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Adults and children requiring treatment to control acute seizures.

Setting
Hospital. The economic analysis was conducted in Auckland, New Zealand.

Dates to which data relate
Effectiveness data were taken from literature published between 1989 and 1996. Resource data were taken from a clinical study whose results were published in 1996. 1994 prices were used.

Source of effectiveness data
Effectiveness data were taken from a review of previously completed studies.

Outcomes assessed in the review
The tolerability profiles and number of adverse events associated with the two drugs were assessed.

Study designs and other criteria for inclusion in the review
Not stated.

Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.
Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
12 primary studies were included. The type of studies included were not specifically stated although these included small randomised trials which also examined the pharmacokinetic properties of the drugs.

Methods of combining primary studies
Not done.

Investigation of differences between primary studies
Not stated.

Results of the review
The tolerability of the drugs was reported to be similar but fosphenytoin was found to be associated with fewer adverse effects in a number of studies. Bio-equivalence had also been demonstrated between the two drugs.

Measure of benefits used in the economic analysis
The economic analysis did not consider benefits, only the costs associated with the two drugs.

Direct costs
The drug acquisition costs and the cost of treating adverse events were estimated. These costs and resources used were taken from an unpublished randomised double blind trial comparing the tolerability of intravenous fosphenytoin and phenytoin. Costs per minute were estimated from staff salaries, benefits and overhead expenditures in an emergency hospital in 1994. Drug costs were taken from average wholesale prices. 1994 prices were used and costs were not discounted. Marginal costs were not analysed in the study.

Statistical analysis of costs
Not conducted.

Indirect Costs
Not calculated.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total cost of treatment with intravenous phenytoin and fosphenytoin per patient per seizure was $543.58 and $156.68 respectively. This included drug acquisition costs per loading of $6.72 and $90.00 respectively and total costs for the treatment of adverse events of $536.86 and $66.68.

Synthesis of costs and benefits
Not applicable.

Authors’ conclusions
The authors concluded that the cost data from the trial show that the higher acquisition costs of phenytoin are more than compensated for by the reduction in the cost of adverse events occurring from the use of the drug. However the sample size in the study cited was small with only 52 patients in the study, of which 39 were randomised to the fosphenytoin group, and it is impossible to make any conclusions about the strength of the cost data in this study. The authors stress the importance of institutions conducting their own pharmacoeconomic analyses using local cost and resource use data before making any decisions on whether to substitute phenytoin with fosphenytoin.

CRD COMMENTARY - Selection of comparators
A justification was provided for the comparators used. Fosphenytoin is a bio-equivalent pro-drug of phenytoin which is fully soluble in water and therefore is likely to cause fewer adverse events either when administered intravenously or by intramuscular injection.

Validity of estimate of measure of benefit
Very little information on the reduction in adverse events associated with fosphenytoin was presented by the authors and it is unclear what methods were used to identify the studies cited. A systematic review would provide more reliable information.

Validity of estimate of costs
Details of resources and costs were reported on a secondary basis from an as yet unpublished study, to which the reader should refer. Costs have been determined from the healthcare payer perspective and have excluded costs experienced by others in society.

Other issues
As noted by the authors, more information is required on the clinical benefits and economic outcomes associated with the two drugs. From the information in this brief review one cannot draw any firm conclusions or generalise cost data to any setting other than the trial population within the US hospital.

Implications of the study
There is a need for well designed clinical and economic evaluations to compare the two drugs and/or a systematic review of existing evidence.

Source of funding
None stated.

Bibliographic details
Other publications of related interest

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Subject indexing assigned by NLM

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