An economic evaluation of prophylactic self-injectable epinephrine to prevent fatalities in children with mild venom anaphylaxis

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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
The study evaluated the cost-effectiveness of prophylactic self-injectable epinephrine to prevent fatalities in children with mild venom anaphylaxis. The author concluded that the intervention is not a cost-effective option if the annual venom-associated fatality rate is less than 2 per 100,000 persons at risk. The study methodology had a few limitations. Although the author's conclusions reflect the analysis undertaken, they should be considered with a degree of caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study evaluated the cost-effectiveness of prophylactic self-injectable epinephrine to prevent fatalities in children with mild venom anaphylaxis.

Interventions
Prophylactic self-injectable epinephrine was compared with "no use of epinephrine".

Location/setting
USA/community.

Methods
Analytical approach:
A Markov model with a time horizon of 40 years was constructed in order to model the progression of children with mild venom anaphylaxis. The author reported the perspective to be societal.

Effectiveness data:
The annual risk of venom fatality was the main clinical estimate. The author computed this using data derived from published literature and from national sources. The methods used to identify the relevant studies and the inclusion criteria were not reported.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The measure of benefit used were the life-years saved and deaths averted. Discounting was conducted appropriately at an annual rate of 3%.

Cost data:
Only the cost of self-injected epinephrine was included in the analysis. It was derived from an online pharmacy. Discounting was appropriately conducted at an annual rate of 3%. The price year was not reported.

Analysis of uncertainty:
A one-way sensitivity analysis was conducted in order to assess the robustness of the results to changes in the age of the cohort, venom anaphylaxis fatality rate and the time horizon of the analysis. The ranges over which the parameters were varied were reported.
**Results**
The incremental cost of the intervention was $1.469 per patient, whereas its incremental cumulative effectiveness was 0.003 years per patient.

The incremental cost-effectiveness ratio (ICER) of the intervention was $469,459 per life-year saved and $6,882,470 per death prevented over a 40-year time horizon.

The one-way sensitivity analysis demonstrated that the ICERs were sensitive to the age of the cohort, fatality rates and the time horizon of the analysis.

**Authors' conclusions**
The author concluded that the use of prophylactic self-injectable epinephrine to prevent fatalities in children with mild venom anaphylaxis is not a cost-effective option if the annual venom-associated fatality rate is less than 2 per 100,000 persons at risk.

**CRD commentary**
*Interventions:*
The intervention was described clearly.

*Effectiveness/Benefits:*
The methods used to identify relevant studies from which to derive effectiveness were not reported. For this reason it is not possible to ascertain the validity of these estimates given the limited information provided by the author. The level of reporting was not sufficient.

*Costs:*
The costs included did not reflect the perspective adopted since only the drug costs were included in the analysis. The costing methods were fairly well reported, with unit costs being provided separately. The price year was not reported, so it will not be possible to revalue the results in future years.

*Results and Analysis:*
The results were reported clearly. A one-way sensitivity analysis was conducted on key parameters in the model. However, it would have been more appropriate to conduct a multi-way sensitivity analysis to address uncertainty in the model. The author acknowledged certain limitations of the study.

*Concluding remarks:*
There were a few limitations to the study methodology. Although the author's conclusions reflect the analysis undertaken, they should be considered with a degree of caution.

**Funding**
None stated.

**Bibliographic details**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Anaphylaxis /prevention & control; Bee Venoms /adverse effects; Bronchodilator Agents /administration & dosage /economics; Child; Cost-Benefit Analysis; Epinephrine /administration & dosage /economics; Humans; Models, Economic; Self Administration