Acetaminophen ingestion in childhood: cost and relative risk of alternative referral strategies

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
Management of acetaminophen ingestion in childhood.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Children who ingested acetaminophen, aged one to six years and referred to a hospital.

Setting
Poison centres. The economic study was carried out in the USA.

Dates to which data relate

Source of effectiveness data
Single study.

Link between effectiveness and cost data
Costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
2091 children who were referred to a hospital for determination of serum acetaminophen concentration. Patients were excluded from further review if no timed serum acetaminophen concentration was determined, the acetaminophen concentration was not recorded, was recorded only as non-toxic or if the timing of the acetaminophen determination could not be established to the closest hour. Only 866 patients from the initial sample had a timed serum acetaminophen concentration recorded. No power calculations related to the sample size were stated.

Study design
Retrospective multicentre chart review (eleven poison centres). Duration and loss to follow-up were not reported.
Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The health outcome considered was the number of children who could be safely managed at home. The degree of risk of hepatic toxicity associated with ingesting acetaminophen was classified in no risk, possible risk, probable risk and high risk.

Effectiveness results
From 866 patients, three patients had results in the "probable risk" area of the nomogram. A referral reduction strategy which would refer only children who ingest 200 mg/kg or more of an adult preparation could eliminate 82% of referrals without missing any of the "probable risk" patients. Six other children were determined to be in the nomogram area labelled "possible risk".

Clinical conclusions
Children less than six years old who ingest pediatric acetaminophen products other than those from packages containing greater than 30 tablets or who ingest less than 200 mg/kg of an adult preparation may be safely managed at home without referral to a hospital.

Measure of benefits used in the economic analysis
Number of children who could be safely managed at home. The degree of risk of hepatic toxicity associated with ingesting acetaminophen was classified in no risk, possible risk, probable risk and high risk.

Direct costs
Direct health service costs were considered such as: emergency physician charge, emergency department charge and the charge for an immediate serum acetaminophen concentration, based on 1992 data. Quantities and costs were not analysed separately.

Currency
US dollars ($).

Sensitivity analysis
The sensitivity of each risk identification strategy was calculated.

Estimated benefits used in the economic analysis
Of 866 patients, 3 had results in the "probable area" of the nomogram and 6 in the "possible area". A referral reduction strategy which would refer only children who ingest 200 mg/kg or more of an adult preparation could eliminate 82% of referrals without missing any of the "probable risk" patients.

Cost results
At an estimated cost of $272 per referral, the cost (1992) of evaluating 2951 children referred to hospital was $1,003,136.

Synthesis of costs and benefits
A referral threshold of 200 mg/kg for the patients in this study would have missed only the most questionably treatable ingestion (6 children) and resulted in a 63% reduction in cost.

Authors' conclusions
Children less than six years of age who ingest pediatric acetaminophen products other than those from packages containing > 30 tablets or who ingest less than 200 mg/kg of an adult preparation may be safely managed at home without referral to a hospital.

CRD Commentary
a) No power calculations related to the sample size were performed. b) The study design is poor. c) The cost analysis could have been more informative.

Bibliographic details

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MeSH
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