Use of in-line filters in pediatric intravenous therapy

Newall F, Ranson K, Robertson J

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
In-line intravenous filters in pediatric therapy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Male and female children with cancer with central venous access devices.

Setting
Pediatric teaching hospital. The economic study was carried out in Perth, Australia.

Dates to which data relate
The main effectiveness data were taken from a single trial. The dates of the resource and cost data were not clearly reported. The price year was not stated.

Source of effectiveness data
The estimate of the incidence of septicaemia in the two study periods was derived from a single trial.

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

Study sample
Overall 88 children with cancer (aged between 3 months and 18 years), and with central venous access devices (CVADs), were included in the analysis. The population sample was divided into two groups: with filter (56) and without filter (62). Thirty-four children were observed for separate periods of time with and without a filter and thus served as their own controls. The eight children who had their CVADs replaced during the study contributed two sets of observations to the data set. Power calculations to determine the sample size were not undertaken.

Study design
This was a before and after study. The authors described the study design as quasiexperimental "similar group pre-test post-test".
Analysis of effectiveness
The analysis of effectiveness was based on treatment completers only. The primary health outcome was the incidence of septicaemia in the two study periods.

Effectiveness results
The relative risk for obtaining a positive blood culture for septicaemia was estimated to be 1.093 and 1.065 (p=0.8481 and p=0.8992) for a fixed period of time and up to the removal of the device or the completion of the study period, respectively.

Clinical conclusions
Children with filters are at a greater (less than 10%) risk of infection. No significant differences exist between the intervention and comparator in terms of septicaemia incidence.

Modelling
The Poisson regression technique was used to model the rate, or frequency in time, of the incidence of septicaemia.

Measure of benefits used in the economic analysis
The effectiveness of in-line filters is not considered to be statistically different compared with no filter usage. As such the economic analysis was based on cost differences only (cost-minimisation).

Direct costs
Details of costs included in the analysis were not provided. Discounting was undertaken, but the discount rate was not stated. The quantity/cost boundary adopted was the hospital. The price year was not stated.

Statistical analysis of costs
Not undertaken.

Indirect Costs
Not considered.

Currency
Australian dollars (Aus$).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The relative risk for obtaining a positive blood culture was estimated to be 1.093 and 1.065 (p=0.8481 and p=0.8992) for a fixed period of time and up to the removal of the device or the completion of the study period, respectively.

Cost results
The savings were estimated to be at least Aus$32,000 per year.
Synthesis of costs and benefits
Costs and benefits were not combined.

Authors' conclusions
There were no demonstrable benefits to the patient if an in-line filter was used during the infusion of fluids via a CVAD. The removal of in-line filters results in significant cost savings.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. A standard practice in cancer intravenous therapy has been to fit filters to all intravenous infusion lines. Exceptions to this practice occurred when blood products, drugs, lipids and other solutions not conducive to filtration were being infused. You, as a user of this database, should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The benefits were found to be similar, the principal benefit was that of cost savings. The data do not appear to have been used selectively.

Validity of estimate of costs
The cost analysis did not specify which direct costs were included. Resource quantities were not reported separately from the prices. The costing methodology lacked some details, in particular the price date was not stated. No statistical analysis was conducted. As the costing was retrospective, the costs need to be treated with a degree of caution.

Other issues
The authors' conclusions are likely to be justified given the uncertainties in the data and the results should be generalisable to other settings. Appropriate comparisons with other studies, supporting the clinical results from the present investigation, were reported. Results do not appear to have been presented selectively.

Implications of the study
Further research is required within the context of a randomised trial.

Source of funding
None stated.

Bibliographic details

PubMedID
9652276

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Catheterization, Central Venous /adverse effects; Child; Child, Preschool; Cross Infection /etiologie/prevention & control; Filtration /instrumentation; Humans; Incidence; Infant; Infection Control; Infusions, Intravenous /adverse effects; Sepsis /etiologie /prevention & control

AccessionNumber
21998007647

Date bibliographic record published
31/08/1999

Date abstract record published
31/08/1999