Bryant traction in paediatric femoral shaft fractures, home traction versus hospitalisation

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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 objective of the study was to examine the clinical and economic impact of Bryant traction performed at home or at hospital in children under 4 years of age or weighing less than 20 kg. The authors concluded that home traction in children was as feasible, simple and effective as hospital traction, while reducing hospital stay and hospital costs. These conclusions should be interpreted with caution given the methodological limitations of the study.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective of the study was to examine the clinical and economic impact of Bryant traction performed at home or at hospital in children under 4 years of age or weighing less than 20 kg.

Interventions
The same procedure, Bryant traction, was performed in two alternative settings: hospital versus home. The parents were provided with instructions and tips for treating their child at home in a mobile traction apparatus.

Location/setting
Netherlands. Hospital/home.

Methods
Analytical approach:
This economic evaluation was based on data derived from a single study. The time horizon was 1 year. The authors did not explicitly state the perspective of the analysis.

Effectiveness data:
The clinical data came from a retrospective review of patients’ charts at the authors’ institution. A sample of 54 children treated for femoral shaft fracture over the period 1991 to 2004 was considered. Thirty-eight children (26 boys and 12 girls) were placed in the home group and 16 children (15 boys and 1 girl) in the hospital group. The median age was 2.3 years in the home group and 1.6 years in the hospital group. The children were followed for 1 year. No statistical approach was used to account for potential bias. However, the study groups were comparable at baseline in terms of the type and severity of fracture.

Monetary benefit and utility valuations:
None.

Measure of benefit:
No summary benefit measure was used in the study as a cost-consequences analysis was performed. The key clinical end points were treatment failure or success and parent satisfaction.

Cost data:
The two main categories of costs included in the analysis were hospital costs and ambulance costs. The source of the costs was not explicitly stated, but it is likely to have been that of the authors’ institution. Resource use was derived from the sample of children considered in the clinical study. The price year was not reported. The costs were in euros (EUR).
Analysis of uncertainty:
The issue of uncertainty was not addressed.

Results
One failure (fracture not closed) in each group was observed.

After 1 year’ follow-up, the mean leg length discrepancy was 0.8 cm (range: 0.5 to 1.0) in the hospital group. In the home group, 9 children showed a leg length discrepancy with a mean of 1.3 cm (range: 0.4 to 3.0), one child had a leg shortening of 3 cm, and all other discrepancies in leg length were within acceptable limits.

Overall, parents were satisfied with traction at home.

There was a significant difference in hospital stay (7.0 days for the home group versus 22.5 days for the hospital group) and total traction period (28.0 days for the home group versus 22.5 days for the hospital group). Thus, the total costs per child were EUR 8,359 in the home group and EUR 25,313 in the hospital group (difference statistically significant).

Authors’ conclusions
The authors concluded that home traction in children was as feasible, simple and effective as hospital traction, while reducing hospital stay and hospital costs. Key points for treatment success were good patient selection and appropriate instructions given to patients.

CRD commentary
Interventions:
The two alternatives under examination were appropriately selected as they were in place at the authors’ institution. A clear description of all instructions given to parents for treating their child at home was provided.

Effectiveness/benefits:
The use of a retrospective review of patients’ charts represents a weak source of data. Such a design might have introduced some selection bias, especially given the long period over which the patients were identified (1991 to 2004). The potential impact of factors other than the study intervention may, therefore, have affected the conclusions of the analysis. A further potential drawback of the analysis was the relatively small sample. These issues tend to limit the internal validity of the analysis. However, the authors stated that the baseline characteristics of the study groups were similar.

Costs:
There was little information on the analysis of the costs. The authors did not give a breakdown of the costs, which were presented as two macro-categories. The sources of the costs were not reported and the perspective of the analysis was unclear, although it could have been that of the authors’ institution. Other details of the study, such as the price year, were not reported. No statistical analysis of the costs was performed.

Analysis and results:
The costs and benefits were not combined as this was cost-consequences analysis. The issue of uncertainty was not addressed. The authors did not discuss the external validity of the analysis, although the results were compared with those from other studies.

Concluding remarks:
On the whole, the analysis has some limitations in terms of the reporting of economic data and design of the clinical study. Thus, caution will be required when interpreting the authors’ conclusions.

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Other publications of related interest


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