Economic evaluation of immunoglobulin replacement in patients with primary antibody deficiencies


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
This study examined the economic impact of lifelong immunoglobulin replacement administered by intravenous or subcutaneous infusions, at home or as an out-patient. The theoretical analysis showed equal efficacy and a small difference in costs between intravenous and subcutaneous administration, but the real-dose data, showed that subcutaneous administration was 25% cheaper than hospital-based intravenous treatment. There were some methodological limitations that might affect the validity of the authors’ conclusions and further studies are needed to corroborate these preliminary findings.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the economic impact of lifelong immunoglobulin replacement, administered either intravenously or by subcutaneous infusion and delivered at home or as an out-patient, for young adults with primary antibody deficiencies.

Interventions
Subcutaneous immunoglobulin was compared against intravenous administration, delivered at home or as an out-patient. The infusion dose was assumed to be 0.45mg per kg, every 21 days, for intravenous immunoglobulin and 0.15mg per kg, every seven days, for subcutaneous immunoglobulin. An alternative analysis, using the real doses received by a group of patients, was also conducted.

Location/setting
France/home and out-patient.

Methods
Analytical approach:
The analysis was based on a simple simulation, with a one-year time horizon. The authors stated that it was carried out from the perspectives of the French social insurer and the patient.

Effectiveness data:
The two treatments were considered to be equally effective on the basis of the results of a systematic review of the literature. A survey of patients with congenital agammaglobulinaemia (Bruton’s disease or autosomal recessive agammaglobulinaemia) or hyper-immunoglobulin M syndrome was carried out, using the Treatment Satisfaction Questionnaire for Medication version II, to determine patient satisfaction.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
No summary benefit measure was used as a cost-minimisation analysis was carried out.

Cost data:
The costs of out-patient treatment included hospital and transport costs. The costs of home care included nurse care and additional devices, such as infusion pumps. The cost of immunoglobulin was fixed by the French authorities, who reimburse the rental cost of the pump. All costs were the reimbursement rates of the national health service. The analysis also included the cost of time lost, based on the French mean gross salary from the National Institute for Statistics and Economic Studies. All costs were in Euros (EUR).

Analysis of uncertainty:
A secondary analysis was conducted, using data from a questionnaire on resource use and costs, given to a sample of 37 patients receiving home or hospital intravenous or home subcutaneous immunoglobulin. These were the same patients as were surveyed for the patient satisfaction data. Several one-way sensitivity analyses were carried out to assess how robust the base-case findings were. Alternative ranges of values were based on authors’ opinions.

Results
The yearly treatment costs were EUR 25,275 for subcutaneous immunoglobulin, EUR 19,807 for home-based intravenous administration, and EUR 26,880 for hospital-based intravenous administration. The materials or number of pumps used were the most influential input to the total treatment costs, followed by transport, the infusion period, and then nurse care.

Using the patient survey data, the total costs, including charges borne by the patients, were EUR 20,289 for subcutaneous, EUR 30,527 for home-based intravenous, and EUR 26,529 for hospital-based intravenous immunoglobulin.

The global satisfaction scores (0=not satisfied; 100=fully satisfied) were 77 for subcutaneous, 83 for home-based intravenous, and 78 for hospital-based intravenous immunoglobulin. The differences between groups were not statistically significant.

Authors’ conclusions
The authors concluded that their theoretical analysis showed equal efficacy and a small difference in costs between the two approaches, but the real-dose analysis showed that subcutaneous administration was 25% cheaper than out-patient intravenous administration. Further studies were needed to validate these findings.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the available treatment options were considered.

Effectiveness/benefits:
The assumption of equal efficacy for the two treatments was justified by the findings of a literature review, but the methods and other characteristics of this review were not reported. It is therefore not possible to assess the accuracy of this key assumption. A clear definition of the treatment efficacy was not given. A validated questionnaire was used to assess the treatment-related quality of life.

Costs:
The economic analysis was satisfactorily carried out and the cost items were consistent with the stated perspective. Justifications for the exclusion of some cost categories were given; the costs of check-up visits were not included as they were similar for the treatment options, and the cost of training for home therapy was not considered as it was low and occurred only once. The data sources were clearly reported and reflected the setting. The authors pointed out that their findings were consistent with the findings of other studies. The alternative analysis, using data from a cohort of patients receiving the three options, was appropriate, but the sample was very small and there were some differences in these patients’ baseline characteristics, such as weight. Thus, the results of the secondary analysis should be treated with caution. The price year was not stated, limiting the possibility of replicating the analysis for other time periods.

Analysis and results:
The results were clearly reported and discussed. The uncertainty was investigated, using a simple approach that focused on individual inputs and did not consider the simultaneous variations in clinical and economic parameters. The data
from the survey were used to assess patient satisfaction and total costs in the secondary analysis, but the low number of patients included reduces the statistical significance of the comparison. The authors noted that the patterns of resource use (pump replacement and rental) might not be generalisable to other health care settings. The number of pumps used was a key factor in determining the total costs and this is likely to vary between settings.

Concluding remarks:
There were some limitations in the methods that might affect the validity of the authors’ conclusions. Further studies are needed to corroborate these preliminary findings.

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