Subcutaneous immunoglobulin replacement in patients with primary antibody deficiencies: safety and costs

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
Immunoglobulin replacement in patients with primary antibody deficiencies.

Type of intervention
Prophylactic treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients aged 34 (range 13 - 76 years) receiving ongoing subcutaneous therapy for primary hypogammaglobulinaemia or IgG subclass deficiencies.

Setting
Hospital out-patient clinics and patients’ homes. The economic study was carried out in Scandinavian countries (Stockholm and Gothenburg-Sweden, Copenhagen-Denmark and Oslo-Norway).

Dates to which data relate
The years in which effectiveness and resource data were collected were not stated. 1993 prices were used.

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
No power calculations relating to the sample size were stated. 165 patients were included in the study. Of these, 126(76%) were previously treated by: intramuscular injections(63), intravenous injections(13) or alternate intramuscular injections and intravenous infusion(44).

From 165 patients, 158 received questionnaires (being over 18 and able to read and write) and 152 replied to the questionnaire.
**Study design**
Non-controlled before and after study. Four centres were included in the analysis. The duration of the replacement therapy ranged from 5 months to 9 years and 8 months. There was no loss to follow-up.

**Analysis of effectiveness**
The analysis of the clinical study was based on intention to treat.

The primary health outcomes used in the analysis were: adverse systemic reactions (classified into mild, moderate, severe and anaphylactoid reactions), occurrence and intensity of tissue reactions at the infusion sites and serum IgG changes.

Questionnaires were used for valuating the tissue reactions.

**Effectiveness results**
106 adverse systemic reactions were reported in 28 patients (17% of 165 patients) during subcutaneous IgG replacement therapy. 100 were mild and 6 moderate. There were no severe anaphylactoid reactions. 87% of 152 patients who answered the questionnaire, experienced some form of tissue reaction.

Of the 126 patients who previously had intramuscular injections and/or intravenous infusions, 48 had experienced adverse systemic reactions. Of these 48 patients, 35 did not have any reactions when they used the subcutaneous route and the 13 others had only mild reactions. In contrast to the intravenous therapy, no signs indicated the transmission of hepatitis virus by intramuscular products given subcutaneously.

A significant correlation was found between the monthly immunoglobulin doses and serum IgG concentrations reached (p<0.01) after 6 months of subcutaneous therapy.

**Clinical conclusions**
The subcutaneous administration of IgG is safe. There are no severe adverse systemic and tissue reactions. The serum IgG concentrations reached are similar to those achieved by intravenous therapy. The method can be used successfully in patients with previous severe reactions to intramuscular injections.

**Measure of benefits used in the economic analysis**
Adverse systemic reactions (classified into mild, moderate, severe and anaphylactoid reactions), occurrence and intensity of tissue reactions at the infusions sites and serum IgG changes.

**Direct costs**
The costs of the replacement therapy to the Swedish health care system were included: immunoglobulin preparations, materials, personnel, rooms and administration overheads. Costs were not discounted.

Quantities and costs were not analysed separately. The estimation of the costs was based on actual data. 1993 prices were used.

**Currency**
US dollars ($). A conversion from Swedish Crowns was carried out at the rate of 7.80 Swedish Crowns to 1 US$.

**Sensitivity analysis**
No sensitivity analysis was carried out.
Estimated benefits used in the economic analysis
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Of the 126 patients who previously had intramuscular injections and/or intravenous infusions, 48 had experienced adverse systemic reactions. Of these 48 patients, 35 did not have any reactions when they used the subcutaneous route and the 13 others had only mild reactions. In contrast to the intravenous therapy, no signs indicated the transmission of hepatitis virus by intramuscular products given subcutaneously.

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Cost results
The yearly costs for the hospital-based intramuscular and subcutaneous treatments were comparable ($3,204 and $4,656) while the cost of intravenous treatment was 3-4 times higher ($14,124).

Comparison between the two home-therapy alternatives showed that the yearly cost of subcutaneous therapy was $3,100 compared with $13,224 for the intravenous therapy. The costs for the immunoglobulin preparations represented most of the total yearly costs: intramuscular therapy 75%, intravenous therapy 93-99%, and subcutaneous therapy 51-78%.

Synthesis of costs and benefits
The clinical and economic findings were not combined.

Authors' conclusions
Subcutaneous administration of IgG is a safe and convenient method of providing immunoglobulins. In Sweden, the subcutaneous instead of intravenous method reduces the annual cost by $10,128 per patient.

CRD Commentary
a) No power calculations related to the sample size are stated.

b) No sensitivity analysis was carried out.

c) More details should have been given in the cost-analysis (eg. dates and sources of data, cost per patient).

d) A synthesis of costs and benefits and an incremental analysis is necessary to compare intramuscular injections and subcutaneous infusions in hospital based therapy.

e) Discounting of costs is necessary given their long-term duration.

Source of funding
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Bibliographic details