Pharmacoeconomics of therapy for Guillain-Barre syndrome: plasma exchange and intravenous immunoglobulin

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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
This study compared the costs and complications of intravenous immunoglobulin or plasma exchange for Guillain-Barre syndrome. The authors concluded that intravenous immunoglobulin reduced the costs, compared with plasma exchange, due to a shorter hospital stay, lower costs for procedures and hospitalisation, fewer complications, and fewer patients requiring assisted ventilation. There were some limitations to the study and some of its methods were not well reported. The authors’ conclusions should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to compare the costs and complications of intravenous immunoglobulin or plasma exchange for Guillain-Barre syndrome.

Interventions
Immunoglobulin, administered intravenously at 0.4g per kg for five days, was compared with four to eight sessions of plasma exchange, at 40mL to 50mL per kg. A control group received conservative treatment only.

Location/setting
Taiwan/hospital

Methods
Analytical approach:
The analysis was based on a retrospective study of 24 patients with Guillain-Barre syndrome who were admitted to Taipei Veterans General hospital between 1999 and 2004. The authors did not state their study perspective.

Effectiveness data:
Intravenous immunoglobulin and plasma exchange were assumed to have equal efficacy, based on three published studies. One, for example, found that there was no statistically significant difference in the change in disability grade, time to walk unaided, mortality and proportion of patients unable to walk at one year. The retrospective analysis also compared complication rates between the two treatments.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
As efficacy was assumed to be equal, no benefit measures were compared, except the number of days to plateau of symptoms and the number of days in hospital.

Cost data:
The cost categories included hospitalisation, drugs, and procedures. Hospital costs included doctors’ fees, ward fees, and pharmacist services. Drug costs included antibiotics, intravenous immunoglobulin and other medications. Procedure costs included laboratory procedures, plasma exchange, and electrophysiological and roentgenological procedures. All
Costs included the resources required to treat complications, such as assisted ventilation, and treatment for pneumonia. The resource use estimates for these cost categories were from the retrospective study. All costs were presented in 2005 Taiwan dollars (TWD).

Analysis of uncertainty:
The statistical significance of differences between variables was assessed using analysis of variance (ANOVA). Probabilities were presented for these tests, with standard deviations for some variables and the standard error of the mean for all variables.

Results
Ten patients received plasma exchange, seven received intravenous immunoglobulin, and seven received control treatment. The ANOVA for the total days to plateau of neuropathic symptoms and signs found no significant differences between the three groups. The plasma exchange group had a much longer hospital stay, but this difference was not statistically significant.

The estimated total mean costs were TWD 517,357 (SE 114,813) for plasma exchange, TWD 360,824 (SE 137,228) for immunoglobulin, and TWD 213,161 (SE 137,228) for control. The drug costs for immunoglobulin (TWD 227,975) were higher than for plasma exchange (TWD 135,740).

The mean total costs for patients who had complications were TWD 1,000,448 for plasma exchange, compared with TWD 552,798 for immunoglobulin. The mean total costs for patients who did not have complications were TWD 310,318 for plasma exchange, compared with TWD 328,828 for immunoglobulin. The differences between groups, in the number of complications and the higher costs of complications, were not statistically significant.

The total mean cost was higher for patients who required ventilation, than for those who did not, and this was statistically significant (p=0.008).

Authors’ conclusions
The authors concluded that intravenous immunoglobulin reduced the costs, compared with plasma exchange, due to a shorter hospital stay, lower costs for procedures and hospitalisation, fewer complications and fewer patients requiring assisted ventilation.

CRD commentary
Interventions:
The interventions were briefly described. It was not clear if these interventions included the usual practice, in this or other settings.

Effectiveness/benefits:
As equivalence between the two interventions was assumed, very few effectiveness data were presented. The data on which this assumption was based were only briefly discussed, making an assessment of their quality impossible, without consulting the original studies. This study concluded that intravenous immunoglobulin had fewer complications and fewer patients required a ventilator. As the study was small (24 patients), these conclusions may be neither generalisable nor appropriate.

Costs:
The perspective was not clearly stated, so it is not clear if all the appropriate cost categories were included. The cost categories were clearly presented. The authors discussed who usually pays for plasma exchange and intravenous immunoglobulin, but it was unclear if these sources supplied the cost estimates. Only the total costs were reported for each of the comparisons, reducing the ability to reproduce the study. The time horizon was unclear, but appears to have been less than one year.

Analysis and results:
This analysis was based on a small retrospective study, which was open to bias. The results were clearly presented. No sensitivity analysis was undertaken. The discussion reported some other relevant effectiveness evidence and other cost analyses on this topic.
Concluding remarks:
There were some limitations to the study and some of its methods were not well reported. The authors' conclusions should be considered with caution.

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