Prospective comparison of valacyclovir and oral ganciclovir for prevention of cytomegalovirus disease in high-risk renal transplant recipients

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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.

Health technology
The study considered prophylactic treatment for cytomegalovirus (CMV) disease, using either 1 g oral ganciclovir (Cymevene; Hoffmann-La Roche) three times daily or 2 g oral valacyclovir (Valtrex; Glaxo Wellcome) four times daily, for 3 months.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population was renal transplant patients at high risk of CMV disease. High risk of CMV was defined as having a CMV mismatch between donor and recipient, treatment with rabbit anti-thymocyte globulin or OKT3, and/or an episode of treated acute rejection.

Setting
The setting was tertiary care. The economic study was carried out in the Czech Republic.

Dates to which data relate
The clinical effectiveness and resource data referred to the period between April 1999 and December 2000. No price year was reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The resource use data were collected retrospectively from the same patient sample that provided the clinical effectiveness data.

Study sample
The patient sample comprised 49 patients identified retrospectively from a sample of patients included in a randomised controlled trial (RCT). Twenty-three patients received ganciclovir, 17 received valacyclovir and 9 were in the control group. No sample size or power calculations were reported.
Study design
This was a sub-sample analysis of an RCT. Sample recruitment and randomisation methods were not reported. Follow-up was for 12 months and no loss to follow-up was reported. The use of blinding was also not reported.

Analysis of effectiveness
The analysis was conducted on an intention to treat basis. The primary health outcomes were incidence of CMV disease, graft and patient survival, graft function and treatment failure. There were no statistically significant differences in the three groups in terms of their demographic characteristics, immunosuppressive therapy, CMV serological combinations, or CMV disease risk factors.

Effectiveness results
Eight (89%) patients in the control group had a total of 13 episodes of CMV disease, compared with two (9%) patients having 2 episodes in the ganciclovir group, (p<0.001) and one (6%) patient having 1 episode in the valacyclovir group, (p<0.001).

Patient survival was 96% in the ganciclovir group, 100% in the valacyclovir group and 100% in the control group.

Graft survival was 87% in the ganciclovir group, 100% in the valacyclovir group and 89% in the control group.

Treatment failure was highest in the control group. The failure rate was 89% in the control group, compared with 17% in the ganciclovir group, (p<0.001) and 6% in the valacyclovir group, (p<0.001).

Mean serum creatinine level and calculated glomerular filtration rate were consistently lowest (non significantly) in the valacyclovir group.

Clinical conclusions
Valacyclovir and ganciclovir are equally effective as prophylaxis for CMV disease in high-risk renal transplant patients.

Measure of benefits used in the economic analysis
No measure of health benefit was combined with the cost data. Therefore, a cost-consequences study was performed.

Direct costs
The direct costs of treating CMV disease incurred by the hospital were included. The sources of the unit costs were not reported. Neither the unit costs nor resource use were specified in the paper. No price year was reported.

Statistical analysis of costs
The cost data were treated deterministically.

Indirect Costs
No indirect costs were included in the study.

Currency
Euros (EUR).

Sensitivity analysis
No sensitivity analysis was undertaken.
Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The 12-month total cost was EUR 3,167 (standard deviation, SD=2,497) per patient in the ganciclovir group and EUR 5,757 (SD=3,877) in the cytomegalovirus group, compared with EUR 7,247 (SD=6,552) in the control group.

Synthesis of costs and benefits
Not relevant.

Authors' conclusions
Valacyclovir and ganciclovir are cost-saving and equally effective when used to prevent cytomegalovirus (CMV) disease in high-risk renal transplant patients. Cost-savings of nearly 50% are possible in comparison with no prophylaxis.

CRD COMMENTARY - Selection of comparators
This study compared prophylactic valacyclovir or ganciclovir. The comparator was chosen as it represented a "do-nothing" approach. You should consider if this is relevant practice in your own setting.

Validity of estimate of measure of effectiveness
The clinical effectiveness data were taken from a retrospectively identified sub-sample of an RCT. This was an appropriate study design for the research question, but the sample was small and was not determined by power calculations. However, the three patient groups were shown to be similar at baseline. As the authors did not compare their sample with the wider patient population, it was not possible to assess how representative the sample was. An appropriate statistical analysis, on an intention to treat basis, was undertaken.

Validity of estimate of measure of benefit
The study was a cost-consequences analysis. The comments in the 'Validity of estimate of measure of effectiveness' field (above) therefore apply.

Validity of estimate of costs
The costs incurred by the hospital in treating CMV disease were included in the study. All the appropriate costs appear to have been included. However, no breakdown of the unit costs and resource use was provided in this paper. In addition, no statistical or sensitivity analysis was undertaken on the cost data. This means that the extent of uncertainty around the cost results was not assessed. These factors reduce the generalisability and transferability of the study findings. No price year was reported, which will hinder any future reflation exercises.

Other issues
The authors do not appear to have reported their results selectively and their conclusion reflected the analysis. They compared their findings to other similar studies, but did not consider how their results could be generalised to other settings. The authors acknowledged that their study was limited by the retrospective identification of the patient sample.

Implications of the study
The authors did not make any recommendations for further research or changes to practice.
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