Superior efficacy of oral ganciclovir over oral acyclovir for cytomegalovirus prophylaxis in kidney-pancreas and pancreas alone recipients

Somerville T, Hurst G, Alloway R, Gaber A, Shokouh-Amiri M H, Stratta R

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
Oral ganciclovir and oral acyclovir used as prophylaxis for patients who have previously received intravenous ganciclovir therapy following pancreas only (PO) or pancreas and kidney transplantation (SKP) in order to minimise cytomegalovirus disease (CMV).

Type of intervention

Economic study type
Cost-effectiveness analysis.

Study population
Recipients of pancreas only, or pancreas and kidney, organ transplants.

Setting
Hospital and community. The economic analysis was conducted in Memphis, Tennessee, USA.

Dates to which data relate
Effectiveness and resource data were collected between January 1995 and 1 November 1997. No base price year was used in the analysis.

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

Link between effectiveness and cost data
Cost data were collected retrospectively using the same patient sample as in the effectiveness analysis.

Study sample
There were 22 patients in the acyclovir group compared with 33 in the ganciclovir group. The mean age of patients in both groups was 40 years of age and 32% of patients were female in the acyclovir group compared with 48% of the ganciclovir group. Similarly 27% and 35% of patients in the two groups respectively received PA transplants. Power calculations were not used to determine the sample size.

Study design
The study was a single centre retrospective before and after cohort study. The duration of follow up was until 1 November 1997 for all patients, a maximum period of 34 months. The average follow up period for patients in the acyclovir group was 24.5 months and for the ganciclovir group average duration of follow-up was 9.4 months. There was no loss to follow-up

**Analysis of effectiveness**
The analysis of effectiveness was based on intention to treat. The primary health outcome was the incidence of CMV disease. At base case analysis, both patient groups had similar demographic and clinical characteristics.

**Effectiveness results**
The incidence of CMV disease in the ganciclovir and acyclovir groups respectively was 59% (13/22) and 13% (4/33). The difference was significant (p<0.01).

**Clinical conclusions**
Oral ganciclovir is an effective treatment for CMV disease and reduces the incidence of CMV disease compared with the use of oral acyclovir after intravenous ganciclovir, improving long term outcomes for patients.

**Measure of benefits used in the economic analysis**
The benefit measure was the incidence of CMV disease.

**Direct costs**
The direct costs of CMV prophylaxis and treatment for CMV were estimated. Costs for ganciclovir and acyclovir were calculated using average wholesale prices and the actual length of patient treatment. Inpatient hospital costs were taken from actual hospital charge data for patients. No base price year was used in the analysis. Costs and benefits were not discounted, which was appropriate given the short duration of treatment and follow up.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not performed.

**Estimated benefits used in the economic analysis**
The incidence of CMV disease in the ganciclovir and acyclovir groups respectively were 59% (13/22) and 13% (4/33).

**Cost results**
The mean total cost per patient of CMV prophylaxis and treatment for CMV disease was $10,014.57 in the ganciclovir group compared with $15,529.26 for patients in the acyclovir group. The mean length of therapy for patients in the two groups respectively was 3.7 months and 5.5 months.

**Synthesis of costs and benefits**
A synthesis of costs and benefits was not conducted by the authors as the intervention was dominant to the comparator.

**Authors’ conclusions**
Oral ganciclovir is a more effective oral treatment for CMV disease than oral acyclovir following initial treatment with intravenous ganciclovir. Furthermore although the costs of therapy are greater, the lower incidence of CMV disease and shorter duration of treatment for patients could lead to a reduction in costs of more than $100,000 per annum for programmes involving 20 patients receiving PA or SKP transplants.

**CRD COMMENTARY - Selection of comparators**
A justification was provided for the comparator used, oral acyclovir, as this regimen had been used in the treatment of patients with CMV disease at the study hospital.

**Validity of estimate of measure of benefit**
The estimate of benefits was based on a small, observational study, for which power calculations were not used to determine sample size. This could render the results of the study prone to bias. The authors also conceded that the study was further limited by the short follow up period for patients receiving oral ganciclovir and that longer term follow up is required.

**Validity of estimate of costs**
Information was provided on costs estimated in the study. However, hospital charge data rather than costs appear to have been used to account for the costs of CMV treatment. It is not clear whether these charge data were converted to costs. It would also have been helpful to have set a base price year rather than using actual cost and charge data which were collected over a period of nearly three years. Future analysis may also wish to consider costs to others in society, particularly given the significant difference in the mean length of therapy for patients between the two groups, and the lower number of inpatient days required for the intervention.

**Other issues**
The results of the analysis may not be generalisable to other settings and need to be tested in further empirical analyses.

**Source of funding**
None stated.

**Bibliographic details**

**PubMedID**
9636628

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Acyclovir /administration & dosage /therapeutic use; Administration, Oral; Adult; Antiviral Agents /administration & dosage /therapeutic use; Costs and Cost Analysis; Cross-Sectional Studies; Cytomegalovirus Infections /economics /epidemiology /prevention & control; Ganciclovir /administration & dosage /therapeutic use; Humans; Incidence; Kidney Transplantation; Pancreas Transplantation; Postoperative Complications; Retrospective Studies; Tennessee;
Time Factors

**AccessionNumber**
21998006744

**Date bibliographic record published**
30/04/2000

**Date abstract record published**
30/04/2000