Abstract  Allocating part of the diminishing resources of the health-care system to new therapeutic approaches needs a decision analysis which should be understood by all partners. This paper defines some of the economic evaluation methods used recently. Through examples of cost/effectiveness and cost/benefit studies performed in the U.K. and Switzerland it shows that, in the European environment at least, especially now that prices are decreasing, serotonin-receptor (5-HT₃) antagonists can and should be used to prevent acute nausea and vomiting.

Key words  Economic analysis  Cost benefit  Cost effectiveness  Serotonin  5-HT₃ receptor antagonists

Introduction

The 1990s are times of increased awareness of the economic impact of new treatment modalities. Administrators and physicians need a proper understanding of the approaches used to evaluate the real cost of the introduction of a new therapeutic modality. This is necessary for administrators who may not grasp the real implications of the new therapy, as they might be concerned only with their own narrowly defined budget. It is necessary as well for the physicians directly concerned by the patients who might benefit from the new treatment, as they have to be able to discuss properly the eventual administrative refusal to introduce a new product or procedure. There is no reason to be oversensitive about these issues, as proper economic management is not incompatible with treatment of cancer [4]. This paper will review some of the approaches proposed in Europe for the evaluation of the economic impact of the introduction of the serotonin-receptor antagonists as antiemetics for patients undergoing cancer therapy.

A pragmatic approach

The simplest approach to economic evaluation of the modern antiemetic treatments was recently outlined in another paper [1], and is a very pragmatic discussion of the realistic assessment of the evidence in favour of a new therapeutic modality. An important consideration in the decision tree, a crucial "node", is to accept that nausea and vomiting are a serious consideration for the cancer patient [3], a fact that is not widely accepted by the non-oncological medical community, for whom patient "comfort" is viewed as a secondary issue [9]. Once this is accepted, the next issue is the demonstration of the superiority of the new approach, a fact that is accepted for prevention of acute emesis, and more than doubtful for delayed emesis [7]. One is then led to conclude that serotonin-receptor antagonists are probably the best choice for prevention of acute nausea and vomiting in highly emetogenic chemotherapy, cost permitting. Cost issues can then be tackled in several ways.
Types of cost studies

Cost/benefit analyses are the ideal form of economic evaluation [2], as they consider in monetary terms the financial costs and the benefits that may accrue by the introduction of a new method.

Cost/effectiveness analyses move a step away from the use of monetary units to assess outcome and introduce the variable of “success” of the therapeutic method under investigation, compared to the success rate of previous methods, to check if the possibly negative outcome of a cost/benefit analysis is offset by the higher effectiveness of the new treatment.

Cost/utility analyses introduce the possibility of using aggregates of different dimensions of benefits in the evaluations, for example by measuring quality-of-life issues along with costs in money terms.

All of the above approaches can then be used from various perspectives, as the variables that one will take into account are quite different if the whole society is considered and not just the impact on the balance sheet of an insurance company.

Cost/benefit analysis

As an example, in Switzerland we conducted an evaluation of the impact of the introduction of granisetron in a major hospital. For this we looked at patients enrolled in a study comparing granisetron given as a single injection (0.4 mg/kg) to the combination of metoclopramide (3 mg/kg injection followed by an 8-h infusion of 3 mg/kg) plus dexamethasone 12 mg i.v. The acquisition costs of both treatments, the additional costs of nursing, pharmacy, etc., are depicted in Table 1 and show that, although direct costs are higher for the “setron”, the indirect costs are often benefits and the final outcome is in favour of the setron in this particular centre. For a more realistic evaluation of the situation one may also want to add the costs of additional treatments given to the patients, and these increase the cost of the traditional treatment with metoclopramide to SF 126 (Swiss francs) and that of granisetron to only SF 105, as the latter is more efficacious (67% success rate versus 42% for the metoclopramide + dexamethasone combination) and has fewer side-effects [8].

Table 1 Cost/benefit study of a “setron” in a major Swiss hospital. Prices at time of study in Swiss francs (SF 1.51 per U.S. $ and SF 1.74 per ECU in February 1994)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost (SF)</th>
<th>Comparator: metoclopramide + dexamethasone</th>
<th>Study drug: granisetron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug</td>
<td>56.42</td>
<td>80.00</td>
<td></td>
</tr>
<tr>
<td>Nursing time</td>
<td>18.80</td>
<td>9.40</td>
<td></td>
</tr>
<tr>
<td>Pharmacy</td>
<td>10.00</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>14.40</td>
<td>6.80</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>99.62</td>
<td>97.20</td>
<td></td>
</tr>
</tbody>
</table>

Cost/effectiveness study

Cunningham [5] has evaluated two groups of patients, one treated with ondansetron at a total dose of 24 mg and the other treated with metoclopramide alone at a total dose of 7 mg/kg. This study included all the variables of the cost/benefit study mentioned above, and reached a different conclusion, reflecting the different pricing structures of the different countries, and also the higher costs of 24 mg ondansetron compared to 3 mg granisetron. Patients treated with the setron had a higher cost of treatment but, when efficacy was accounted for in a cost/effectiveness approach (Table 2), the setron arm, which was clearly more efficacious, came out as being comparable to the metoclopramide arm. It should be noted that these authors did not take into account in their calculations the initial nursing and material costs but rather those implied by the treatment of the patients who had failed therapy.

Budgetary impact of setrons

A different approach has been discussed in Europe, taking as a model the pricing structure of a large British community hospital [6]. These authors have looked at various variations of a model of the costs of treatment of cancer patients, whereby in this English centre antiemetic treatment represented around 3% of the costing structure of anticancer treatments. If one consider the use of serotonin antagonists as first-line treatment for