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EDITORIAL

Gambling with Gastroesophageal Reflux Disease: Should We Worry about the QALY?

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Gastroenterologists mainly deal with chronic organic and functional illnesses that are not life threatening but can be expensive to treat. How this compares with the management of other diseases that cause significant mortality is an important question to answer if health-care resources are to be allocated appropriately. Comparing health care in terms of cost per quality adjusted life year (QALY) gained is one approach to this problem although there are concerns about whose values should be elicited and how QALYs are measured.

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Clinicians are often justifiably suspicious of the results of health economic analyses. We are uncomfortable with putting a value on human suffering and there is concern over the validity of some of the techniques used. Health economists have, however, highlighted that no society can afford to provide immediate and comprehensive health care to everyone that might possibly need it and therefore rationing pervades all health-care systems. For example, in the United States an individual may be denied some health care because of the type of insurance policy they hold whereas in Canada or the United Kingdom long waiting lists limit access to specialist services. The reality is that we have to use the resources available for health care to maximize benefits in a manner that is socially acceptable. At the heart of this problem is how to translate diverse health-care interventions with very different effects into an outcome measure that is universal. The treatment of gastroesophageal reflux disease (GERD) is a good example of this. Twenty percent of subjects in the United States suffer from heartburn at least once a week (1) and GERD patients that seek health care are estimated to cost on average $5,000 per year (2). GERD is not a life threatening illness, and it has been suggested that acid suppressing therapies are lifestyle drugs and spending on these agents should be curbed (3). While most gastroenterologists would not welcome a reduction in antisecretory prescribing for patients with definite GERD that significantly impacts on quality of life, it is important to justify spending money on this disease as opposed to alternative health-care programs that could potentially save lives, such as an increase in spending on statins.

Health economists have grappled with this issue and one solution that has been proposed is the concept of the QALY (4). The principal underlying the QALY is that health can be divided into the duration and quality of life, and that both of these components can be "traded" with each other. According to this theory a person would be ambivalent about having 10 yr left to live in perfect health (a QALY score of 1.0) or 20 yr of a health state with a QALY score of 0.5. This relatively simple concept allows all health-care interventions to be compared with each other in terms of cost per QALY gained. This approach was first used to compare medical therapy with coronary artery bypass grafting (5) and since then it has been applied to a large number of disparate therapies. Subsequently, league tables have been constructed to compare the cost per QALY gained of different programs either within gastroenterology (6) or more generally (7).

Gerson *et al.* (8) describe an elegant study that comprehensively employed different methods to place a value on how much GERD impacts on quality of life in 158 patients. The methods they employed essentially estimate QALYs although they did not use this term. The commonest value they obtained for GERD was 0.94. If we assume that PPI therapy is 90% effective (9) and costs $20 per month (10) then a very approximate calculation suggests acid suppression for GERD costs $4,000/QALY gained. This is much cheaper than figures reported by other workers that derived QALYs from expert opinion (11, 12) emphasizing the importance of accurately estimating QALYs in a real patient population before believing the results. A cost of $4,000/QALY gained is consistent with another economic analysis of PPI therapy in GERD (13) and suggests that this is a very cost-effective strategy. The median value of all health-care interventions is $12,000/QALY gained (7) and, as an example, warfarin therapy in nonvalvular atrial fibrillation is estimated to cost $15,000/QALY gained (14).

Gerson *et al.* (8) have therefore given us valuable information on how cost-effective GERD therapy is compared to other health-care interventions. There are, however, major problems with using QALYs to estimate health benefit. Whilst there is little argument that length and quality of life are important, there are concerns about whose values should be obtained. Gerson *et al.* (8) determined this from patients with GERD as they are in the best position to know the

impact symptoms have on quality of life. However, if QALYs are being used to decide whether a therapy is cost-effective, patients may knowingly or unknowingly exaggerate the impact the disease has on their quality of life so that their condition receives greater priority. The results also may not truly reflect public values if patients with GERD are not typical of the general population in other respects such as socioeconomic status. The alternative is to describe the symptoms of GERD to the general population and ask them to place a utility on treatment. This will ensure that the subjects chosen are more representative of those paying for the health service but they will have no true understanding of what it is like to have GERD (15). There is no definitive solution to this problem, and values from either patients or the general population are currently accepted, provided there is awareness of the limitations of the approach taken.

There are also criticisms of how QALYs are measured. The commonest methods are time trade-off and standard gamble techniques. For time trade-off, the respondent is given a hypothetical length of life in a specified health state and is given successive scenarios involving shorter lengths of life in perfect health. A QALY is derived from the point at which the participant is ambivalent over which state they prefer. For example, if a patient with GERD is hypothetically given 10 yr of life and feels this is equivalent to 9 yr of life in perfect health then the QALY for GERD is 0.9. For standard gamble, the subject is given a hypothetical length of life in a given health state and asked to choose between this and the same length of life in perfect health but with a variable probability of quick painless death at the start of treatment. Again a QALY is derived from the probability of death at which the respondent is ambivalent between the two scenarios. Decision theorists tend to favor the standard gamble technique as it forces the subject to make a decision under uncertainty, although this can be difficult to understand and complete (16). A major concern with both of these techniques is that they can give different answers (17) and in the absence of a gold standard, it is impossible to decide which, if any, of the approaches are correct. The paper by Gerson *et al.* (5) is a good example of this as the QALY estimate was reduced off therapy for the time trade-off method of measuring GERD health states but this did not change for the standard gamble approach. There are other problems in the measurement of QALYs. Patients with chronic disorders tend to adapt to their illnesses over time (18) with an improvement in their quality of life. It is difficult to capture this with QALYs unless patients are assessed at the start of their problem and followed up over long periods of time. Subtle changes in the respondents state such as whether they are hungry or have been kept waiting can significantly alter their QALY estimate of a given health state (19). There is concern about how accurately QALYs can capture the value of treating mild disease. Giving subjects with relatively minor complaints scenarios that involve a possibility of death are not realistic for the treatments on offer, and it is difficult for respondents to give a sensible answer. Indeed, Daniel Kahneman won the 2002 Nobel Prize in Economics in part for work that was critical of how QALYs are measured psychometrically (20) and has come to the conclusion that this may never be possible (21).

The main alternative to QALYs is to measure how subjects value the treatment of a given disorder in monetary terms (22). The advantage of this approach is that everyone understands the value of the dollar whereas a QALY is a more abstract term. This is particularly true in relatively mild diseases where the QALY gain is very small and even harder to conceptualize (*e.g.*, it would be difficult to measure and comprehend a gain in QALY of 0.01). The monetary value placed on treating mild disease would also be relatively small but this is an advantage as we are all used to exchanging small sums of money every day. QALYs only measure a gain in health and do not capture other aspects of the health-care process such as waiting for investigations or the inconvenience of having to take a tablet four times a day. These "none health" outcomes can be captured by asking respondents how much they are willing to pay for reduced waiting times or a more convenient pharmacological profile (23).

Many of the problems highlighted for QALYs however, also apply to measuring health gain in monetary terms so this is not a solution to the problem of how to value health just an alternative approach. Health economics is an emerging discipline and until techniques are refined, it is important to assess how we value the treatment of GI diseases such as GERD by multiple methods. We will then have a richer picture of how cost-effective GI interventions are compared to other disciplines. For example, willingness to pay for one month of relief of GERD symptoms has been valued at $182 (24) which is much cheaper than the cost of PPI therapy. Therefore both QALY estimates and willingness to pay suggest PPI therapy is good value for money in GERD patients.

Gastroenterologists diagnose some of the commonest causes of cancer mortality but the contribution of all these cancers to population death rates is small compared to ischemic heart disease and cerebrovascular disease. We do, however, manage irritable bowel syndrome, functional dyspepsia and gastroesophageal disease (GERD), which are very common chronic problems in the community and associated with considerable suffering and cost. We need to encourage research such as that presented by Gerson *et al.* (8) if we are to place a value on the majority of the work that we do.

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