EDITORIAL

Cost-effectiveness modelling

In this issue of Human Reproduction we publish two papers on the cost-effectiveness of gonadotrophin therapies within IVF in the UK (Daya et al., 2001; Sykes et al., 2001). Cost-effectiveness issues are essentially a parochial activity since costing aspects are inevitably different in different health care systems, but although the detailed outcome of such an analysis is restricted to practice in one country, there are often insights of wider application as a result of the analysis and the methods used.

The central importance of cost-effectiveness analyses in informing health care decisions was recognized by the UK Government in the establishment, a few years ago, of the National Institute of Clinical Excellence (NICE). Amongst its tasks, NICE evaluates whether interventions are likely to result in a significant health benefit and whether an intervention will have a significant impact on National Health Service (NHS) resources (financial or other) if given to all patients for whom it is indicated. Relevant to the world of reproductive and post-reproductive medicine, there has been a recent announcement that NICE will now be analysing the cost-effectiveness of treatments for infertility in the UK and also the cost-effectiveness of treatments for osteoporosis.

Compared with the questions involved in clinical effectiveness analysis, the questions and analyses involved in cost-effectiveness decisions can be particularly complex and multilayered and have become increasingly sophisticated in recent years. My own direct experience of this largely derives from my involvement in modelling in post-reproductive health. More than 10 years ago, our Oxford group started work on constructing a computer model which tried to encompass the multiple effects of hormone replacement therapy (HRT) on different aspects of post-menopausal health, and learned how open ended is the range of horizons which might be considered (Daly et al., 1992, 1996). Having modelled in the disease events avoided, and the disease events caused by using HRT, we modelled the related costs involved, including GP monitoring and drug costs. Added complexity was the need to include the possibility of increased hospital involvement for some women because of vaginal bleeding, leading to increased rates of endometrial biopsy and hysterectomy. Another complexity was modelling the ‘costs’ incurred by the health system because of the slightly greater life expectancy of women using HRT. These cost estimates were further modulated by quality of life measures developed by the group (Daly et al., 1993). When I subsequently Chaired the Department of Health Advisory Group on Osteoporosis, our report (Barlow, 1994) estimated the cost burden of the disease and in that case the modelling was extended beyond consideration of acute in-patient, out-patient and primary care costs to include institutional costs such as nursing and residential home and geriatric ward costs. This was followed by editing the Royal College of Physicians Osteoporosis Guidelines where David Torgerson built on that work to provide cost-effectiveness estimates for osteoporosis therapies (Royal College of Physicians, 1999). It was fascinating to see how, for any given treatment of osteoporosis, the cost per averted fracture modulated downwards if bone densitometry were used to focus the use of therapy, and how sensitive was the marginal cost per averted fracture to estimates of treatment cost. In all of this modelling work, assumptions and estimates played a major role in determining the outcome, so it is critical that the basis for these assumptions is best evidence and that bias is minimized.

As with the multifaceted post-menopausal work I have described, the construction of economic models in the IVF setting involves multiple decision points and many necessary assumptions in building realistic models of a quite complex care process, as can be seen in the two papers published in this issue of Human Reproduction. There are a number of similarities between the two papers we have published: both model gonadotrophin drug therapies over three cycles of IVF, both use variations of Markov modelling (Briggs and Sculpher, 1998), both use expert clinical panels to provide estimates of outcomes, both involve pharmaceutical company employees within their authorship and both involve individuals with relevant methodological expertise. Differences in their approaches include the choice of evidence and information on which they base their modelling and the detailed methodological approaches adopted, in particular with reference to handling uncertainty (Monte Carlo simulation versus sensitivity analysis).

An issue that has been raised is the extent to which an analysis of this type is appropriate to direct pharmaceutical company involvement since the objectivity of the model is of great importance yet hard to verify. In some examples, there will be limited hard evidence or there may be scope for discretion on the part of the model builders as to what evidence to use. There is also a lack of consensus amongst health economists concerning the methodologies that should be used to construct and assess these models (Sculpher et al., 2000). This issue of direct pharmaceutical involvement in modelling studies has met with differing views from our referees. It is a matter to which we shall give further consideration on Human Reproduction in collaboration with the Publications Subcommittee of ESHRE in the near future. This reconsideration is timely in the light of the revised guidance on sponsorship,
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authorship and accountability published in the New England Journal of Medicine on September 13, which has been adopted by the International Committee of Medical Journal Editors (Davidoff et al., 2001).

References


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