Economic Cost and Cost-Effectiveness

F. Comhaire, A. Mahmoud

Optimal health care is a universal human right. Alas, this right can be claimed by only a fraction of the world's population, and many persons in large areas are deprived of this right. On the other hand, the financial cost to implement this right in both poor and wealthier parts of the world is enormous. In addition, providing adequate health care to the population seems to be a rather low priority in certain countries where greater financial means are being invested in other projects (e.g. waging wars). In so-called developed and wealthier countries, the care for an increasing proportion of aging persons, the enhanced prevalence of certain diseases related to the modern lifestyle, unsuitable nutrition and environmental contamination, for example, and the availability of new but commonly expensive modalities of treatment make the cost of medical care for the entire population hardly bearable.

Therefore it is mandatory and, in fact, part of the deontological obligation of all clinicians to make the best possible use of financial means, both public and private money, by selecting the most cost-effective modalities for diagnosing and treating the patient. Also, the cost-effectiveness of methods for the prevention and/or early detection of diseases, or of impaired health and function must be assessed.

For the majority of problems in the field of clinical andrology, there are several possible options with regard to investigation and management. Aside from the fact that internal and external auditing is required to assess the good quality of the care delivered, medical strategies must continuously be evaluated as to their cost-effectiveness and the optimal approach.

In the field of surgery, the endoscopic approach may sometimes be as effective but less expensive compared...
to open surgery, by shortening the duration of hospital stay and the time needed to recover and to resume economically rewarding work, for example.

Also, in vasectomized patients surgical reversal is more cost-effective than IVF with ICSI (Pavlovich and Schlegel 1997).

Another example relates to the systematic and periodic measurement of prostate-specific antigen (PSA) in the blood of men over a certain age, in view of the early detection and more effective treatment of cancer of the prostate.

With respect to the management of reproductive disorders, the World Health Organization and the United Nations Population Fund have set the goal to universal access to reproductive health care no later than 2015, including the prevention and appropriate treatment of infertility (WHO 2003). Considering the enormity of this task and its massive financial consequences (Collins et al. 1997), methods for the diagnosis and management of the infertile male in particular should be scrupulously evaluated for their cost-effectiveness (Comhaire 1995). Cost not only refers to expenses carried by the public healthcare systems and insurance, but also by the patients involved (Collins 2002; Pratt 2004). In doing so, it is the cost per delivery of a healthy singleton that must be the end-point, but the effective cumulative pregnancy rate and the time needed to attain the desired pregnancy are also important (Comhaire et al. 1996).

Calculation of the direct cost per delivery is rather simple and can be done by dividing the cost per treatment by the rate of success in terms of the probability of a healthy singleton will result from that particular treatment. A clear-cut example of this calculation is the cost per delivery after in vitro fertilization in case of couple infertility due to oligozoospermia (Neumann et al. 1994). The net cost per treatment cycle, including medication for ovarian hyperstimulation, cycle monitoring, pick-up and laboratory expenses amounts to a minimum of 2,500 €. The take-baby-home rate per treatment cycle is approximately 20%, so the direct cost per delivery is between at least 12,500 €. Other estimations result in a cost per successful outcome in the first treatment cycle of US $60,000 (Griffin and Panak 1998). This cost increases with the increasing number of treatment cycles (Trad et al. 1995), reaching approximately US $114,000 in the 6th cycle (Neumann et al. 1994). Estimations do not include indirect costs and economic factors, such as time away from work, cost for postnatal care of the newborn which is approximately five times higher than after natural conception (Callahan et al. 1994; Wolner-Hanssen and Rydhstroem 1998), and complementary expenses for the treatment of congenital defects or problems during development.

Using this approach, it is possible to estimate the cost per successful delivery for different modes of treatment of the infertile male (Fig. 1; Comhaire 1995). The best cost-effectiveness is, in order: tamoxifen treatment, one or two cycles of IUI (Goverde et al. 2000; Philips et al. 2000), and varicocele treatment (Schlegel 1997; Benson et al. 2002). Since the spontaneous pregnancy rate during counselling (also referred to as treatment-independent pregnancy rate or tender loving care) is relatively low, the cost-effectiveness of this approach is poor, particularly in couples with longer duration of infertility (Mol et al. 2000). Also, the cost per delivery of IUI is high in the 3rd and 4th cycles of IUI, because of the decreasing conception rates. There is preliminary evidence that complementing established treatment modalities by food supplementation may decrease the time to pregnancy, reducing the cost per delivery. The cost per delivery of IVF for male subfertility is highest, even more when used in older women (Legro et al. 1997), while ICSI may be slightly better from this point of view because of the higher immediate success rate. It is a matter of debate whether or not insemination with donor semen should also be included in the comparison of cost-effectiveness (Granberg et al. 1996).

Knowing the frequency of particular aetiological andrological diagnoses in the patient population visiting infertility clinics, the effective cumulative pregnancy rates and cost per successful outcome of various treatment modalities, it is estimated that no more than 80 deliveries can be obtained with an investment of 1 million € when IVF is used as primary treatment, as compared to approximately 300 deliveries when treating the subfertile men in agreement with the WHO guidelines (Comhaire 1995). Therefore, the latter ap-