Long-term cost analysis of treatment options for benign prostatic hyperplasia in Norway

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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
The study compared 5-alpha reductase inhibitors (5-ARIS) and a surgical intervention for the treatment of benign prostatic hyperplasia (BPH). The 5-ARIS studies were dutasteride, finasteride and tamsulosin. The surgical intervention was transurethral resection of the prostate (TURP).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised a hypothetical cohort of 1,000 BPH patients with moderate to severe symptoms in each treatment option. No further inclusion or exclusion criteria were reported.

Setting
The setting was not explicitly stated, but it seems to have been primary and secondary care. The economic study was carried out in Norway.

Dates to which data relate
The epidemiological and clinical effectiveness data were derived from official national sources published in 1999 and 2000 and from studies published between 1995 and 2002. The costs and resource use data were derived from official sources and from available studies published between 2000 and 2003. The price year was not explicitly reported, but it appears to have been 2004.

Source of effectiveness data
The clinical parameters estimated included:

- symptom improvement (for dutasteride, finasteride, tamsulosin and TURP);
- the rate of acute urinary retention (AUR) (for dutasteride, finasteride, tamsulosin and TURP);
- the rate of surgical intervention (for dutasteride, finasteride, tamsulosin and TURP);
- the probability of prostate cancer;
- the probability of death;
- the regression rate;
the recurrence of AUR; and
the probability of AUR then TURP.

Modelling
A Markov model was developed to estimate clinical progression over both 4 and 15.5 years. Details such as the health states, cycle length and time-dependent transition probabilities were presented in full in the paper.

Sources searched to identify primary studies
The clinical effectiveness data were derived from a number of large, randomised placebo-controlled trials. Where data from randomised placebo-controlled trials were not available, they were based on expert opinion. Norwegian Cancer Registry data were used to estimate the risk of prostate cancer.

Methods used to judge relevance and validity, and for extracting data
The process used to identify the data was not reported. No inclusion criteria for any of parameters were explicitly specified; however, it would appear that the authors attempted to include only data from large, randomised placebo-controlled trials. The method used to select the estimates was neither reported, nor discussed.

Measure of benefits used in the economic analysis
The authors did not use a summary measure of benefit in the economic analysis. In effect, a cost-consequences analysis was performed.

Direct costs
Health service costs were included in the analysis. These comprised the costs of drugs, general practitioner (GP) and urologist visits, Diagnosis Related Group costs for TURP with and without complications, prostate cancer evaluation, post-TURP late complication and AUR-related costs. AUR-related costs covered hospitalisation, treatment delivered at home, GP visits, ambulance transportation, indwelling catheter and catheter removal, and drugs. The costs and resource use data were either obtained from official published sources or expert opinion, and were reported separately for all cost categories except AUR-related costs. The cost of treating prostate cancer and the cost of death were excluded from the analysis as they were assumed to be equal for all treatment groups. All costs excluded value added tax and were discounted at a rate of 5%. The price year was not explicitly reported.

Statistical analysis of costs
Where necessary, weighted averages where calculated in order to reflect resource use in the hypothetical cohort.

Indirect Costs
Productivity costs were only included in the sensitivity analysis as the perspective adopted in the base-case analysis was that of the health service. Indirect costs referred to leisure time loss and productivity losses. Resource use was based on authors’ assumptions, while the cost data were derived from a published study. The costs and the quantities were analysed separately. The costs were discounted at a rate of 5%.

Currency
Norwegian kroner (NOK). The costs were subsequently reported in euros (EUR) using the conversion rate NOK 1.00 = EUR 0.122.

Sensitivity analysis
Parameter uncertainty was investigated using one-way sensitivity analyses. All of the model parameters appear to have been investigated. However, the ranges used were not explicitly reported for all parameters, nor were the methods used to derive them. Productivity and leisure time losses were also accounted for in the sensitivity analysis. Subsequently, parameters shown to have had the greatest impact on the results were further investigated in a multi-way sensitivity analysis. Specifically, indirect costs were included, the probability of AUR was reduced by 10%, the probability of TURP after AUR was reduced by 25%, and the costs of TURP and AUR were reduced by 10%.

**Estimated benefits used in the economic analysis**
The authors did not derive a summary measure of benefit in the economic analysis.

**Cost results**
The total costs were reported per patient.

Dutasteride was the least costly strategy, incurring a cost of NOK 13,946.14 (EUR 1,702.81) over 4 years and NOK 32,136.75 (EUR 3,923.96) over 15.5 years. Finasteride and tamsulosin were ranked second and third in terms of cost.

TURP was the most costly strategy incurring a cost of NOK 46,309.38 (EUR 5,654.46) over 4 years and NOK 50,471.18 (EUR 6164.15) over 15.5 years.

The sensitivity analyses demonstrated that the relative order of the total expected costs did not alter.

**Synthesis of costs and benefits**
The costs and benefits were not combined.

**Authors’ conclusions**
Dutasteride was the least costly strategy over 4- and 15.5-year time horizons. It constitutes a suitable treatment module for patients with moderate to severe symptoms and an enlarged prostate (>30 mL).

**CRD COMMENTARY - Selection of comparators**
The selection of the comparators was justified. All the treatment options compared appear to have represented the most commonly used technology in the authors’ setting for the treatment of BPH patients with moderate to severe symptoms. However, the authors acknowledged that the model did not account for open prostatectomy, which is an additional surgical treatment option. You should decide if these represent valid health technologies in your own setting.

**Validity of estimate of measure of effectiveness**
The process used to identify the data was not reported. However, much of the data appears to have been obtained from a number of large, randomised placebo-controlled trials, which potentially have an adequate level of internal validity. Where data were not available, they were based on clinical opinion but the specific methods used to estimate effectiveness were not stated. National data were also utilised where appropriate.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of benefit. In effect, a cost-consequences analysis was performed.

**Validity of estimate of costs**
The base-case analysis of the costs was performed from the perspective of the Norwegian National Health Service, with a societal perspective being adopted in the sensitivity analysis. It appears that in both cases all the relevant costs of therapy were included in the analysis, although both the cost of prostate cancer treatment and the cost of death were excluded. This was justified as they were common to all therapies. Adjustments for inflation and the price year were
not reported, which may hinder future reflation exercises. Resource use and unit cost data were reported separately and their sources were stated. The costs were discounted at an annual rate of 5%, which would appear appropriate in this instance. The issue of generalisability beyond the study setting was not investigated. The cost estimates were investigated in the sensitivity analysis, but the rationale used to derive the ranges used was not reported.

Other issues
The authors did not compare their findings with those from other studies, so it is not known how far their results agree with published results. The authors acknowledged variation in the cost data between settings and evaluated its impact on the cost results in sensitivity analyses. The authors do not appear to have presented their results selectively. Their conclusions referred to BPH patients with moderate to severe symptoms and an enlarged prostate (>30 mL), but study population characteristics in relation to prostate volume were not reported at the outset. It is therefore not possible to judge whether the authors’ conclusions were an accurate reflection of the scope of the analysis.

The authors reported a number of limitations to their study, mainly referring to the uncertainty surrounding data sources and the availability of estimates of effectiveness. In addition, the model was unable to account for the fact that in clinical settings treatment selection was biased by physicians’ preferences.

Implications of the study
The authors did not make any recommendations for further research or changes to practice.

Source of funding
None stated.

Bibliographic details

PubMedID
17454951

DOI
10.1080/00365590600911266

Other publications of related interest
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Indexing Status
Subject indexing assigned by NLM

MeSH
Azasteroids /therapeutic use; Costs and Cost Analysis; Dutasteride; Finasteride /therapeutic use; Humans; Male; Norway; Prostatic Hyperplasia /economics /therapy; Sulfonamides /therapeutic use; Time Factors; Transurethral Resection of Prostate

AccessionNumber
22007000809