Cost-effectiveness of percutaneous tibial nerve stimulation versus extended release tolterodine for overactive bladder

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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.

CRD summary
The objective of the study was to assess the cost effectiveness of percutaneous tibial nerve stimulation and extended release tolterodine in the initial management of overactive bladder. The authors concluded that percutaneous tibial nerve stimulation was not cost-effective in the treatment of overactive bladder compared with extended release tolterodine. The methodology of the study was satisfactory and the results were well reported. Although some of the methods could have been better reported, the authors’ conclusions appear appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective of the study was to assess the cost effectiveness of percutaneous tibial nerve stimulation (PTNS) and extended release tolterodine in the initial management of overactive bladder.

Interventions
PTNS consisted of 12 sessions for three months followed by maintenance therapy. This was compared with 4mg dose extended release tolterodine.

Location/setting
United States/Hospital.

Methods
Analytical approach:
A decision model was constructed to synthesise cost and outcome data from published literature. A one-year time horizon was considered. A societal perspective was adopted.

Effectiveness data:
Effectiveness data were derived through a literature review of human subject articles published in English in PubMed from 1980. Estimates on improvement and continuation of the two treatment options were derived from randomised controlled trial (RCT) data, where available. Estimates from retrospective and prospective cohort studies were used where there were no RCT data. The main measure of clinical effectiveness was improved and/or continuation of urinary incontinence; these estimates were derived from a Cochrane review and supplemented with retrospective and prospective cohort studies.

Monetary benefit and utility valuations:
Utility values were derived from a published study supplemented by author assumption.

Measure of benefit:
The benefit measure was quality-adjusted life years (QALYs).

Cost data:
The economic analysis included the cost of tolterodine, PTNS equipment and session costs, outpatient visits, side effects and urinary incontinence/improved urinary incontinence costs. Unit cost data were derived from various
published sources that included Medicare physician fee schedule and published studies. The price year was 2010 and all costs were reported in USA dollars ($).

Analysis of uncertainty:
One-way sensitivity analysis was carried out on key model inputs. The results were displayed on a tornado diagram. Monte Carlo simulation was carried out using a triangular distribution for all variables with 100,000 simulations.

Results
For every 100 patients treated with PTNS compared with extended release tolterodine, costs increased by $303,480 ($437,540 compared with $134,060) with an additional 4.3 QALYs achieved. The incremental cost effectiveness ratio (ICER) of PTNS was $70,754 per QALY gained.

One-way sensitivity analysis indicated that the results were sensitive to changes in changes in utility values and persistence of treatment. The probability of PTNS being cost effective at a willingness to pay of $50,000 per QALY gained was 21%.

Authors’ conclusions
The authors concluded that PTNS was not cost-effective in the treatment of overactive bladder compared with extended release tolterodine.

CRD commentary
Interventions:
The interventions were adequately described and appeared to be appropriate comparators.

Effectiveness/benefits:
An extensive literature review was conducted to identify the relevant sources of evidence and ensure that the best available evidence was included in the study. Inclusion criteria and methods used to combine data were not discussed, so their quality could not be assessed. A hierarchy of study types was identified and where possible RCT data were used to ensure that sources of evidence were high quality. QALYs were an appropriate outcome measure to capture the impact of the interventions on both length and quality of life and to be generalisable to other diseases. Very little information was provided on the utility estimates used so readers would need to refer to the referenced papers to fully assess their quality.

Costs:
The societal perspective of the study was clearly stated. Only direct medial costs were considered in the analysis, which may mean that costs for each intervention were underestimated. The source of the resource use estimates was unclear and so their quality and appropriateness was unclear. Sources of cost estimates were reported and were appropriate for the study setting. Some costs were presented as category totals and this reduced the transparency of the costs analysis. Given the relatively short time horizon, it was appropriate not to use discounting.

Analysis and results:
The analytical approach appeared appropriate and was described adequately; a diagram was included. An incremental approach was appropriately used to combine the costs and benefits for the alternative strategies. Uncertainty was investigated appropriately through one-way and probabilistic sensitivity analyses. Results of the analysis were reported. It would have been helpful to know the number of QALYs associated with each intervention rather than just the differences between them. The analysis should be generalisable to similar settings. The authors noted some limitations with their study, particularly for the availability of relevant published data.

Concluding remarks:
The methodology of the study was satisfactory and the results were well reported. Although some of the methods could have been better reported, the authors’ conclusions appear appropriate.

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