Cost-effectiveness analysis of sacral neuromodulation and botulinum toxin A treatment for patients with idiopathic overactive bladder
Leong RK, de Wachter SG, Joore MA, van Kerrebroeck PE

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
This study evaluated the cost-effectiveness of sacral nerve stimulation (sacral neuromodulation) compared with botulinum toxin A for the treatment of patients with refractory idiopathic overactive bladder. The authors concluded that sacral nerve stimulation was cost-effective over five years, compared with botulinum toxin A, except in some scenarios, such as if botulinum toxin A was administered under local anaesthetic. The results were reported well. The methods were satisfactory, but not fully reported, making it difficult to assess the conclusions.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of sacral nerve stimulation (sacral neuromodulation), compared with botulinum toxin A, for the treatment of patients with refractory idiopathic overactive bladder.

Interventions
Sacral nerve stimulation was compared with botulinum toxin A (200 units of BOTOX). Sacral nerve stimulation included a first stage tined lead test, followed by definitive implantation if the test was successful. All procedures were performed in an operating theatre.

Location/setting
Netherlands/secondary care.

Methods
Analytical approach:
The authors used a probabilistic Markov model to combine the costs and effectiveness data. The time horizon was five years and the authors stated that the perspective was societal.

Effectiveness data:
The effectiveness data came from published studies or an expert panel of 13 urologists from the Netherlands. The main clinical estimate was the success of treatment, which was defined as a reduction by 50% or more in incontinence episodes or urgency frequency.

Monetary benefit and utility valuations:
The utility values were from a published economic evaluation that used the Health Utilities Index (HUI) 3 and assessed women with stress incontinence.

Measure of benefit:
The primary measure of benefit was quality-adjusted life-years (QALYs) and these were discounted at an annual rate of 1.5%.

Cost data:
The cost categories included the direct health care resources, treatment, and adverse events. These costs were from published sources. The costs were in 2008 Euros (EUR) and were discounted at a rate of 4% per annum.
Analysis of uncertainty:
One-way sensitivity analyses were performed, using second-order Monte Carlo simulation with 1,000 random selections. The results were presented in cost-effectiveness acceptability curves. Some scenario analyses were undertaken.

Results
Over five years, sacral nerve stimulation was estimated to produce an average of 4.95 QALYs per patient, compared with 4.72 QALYs for botulinum toxin A; an additional 0.23 QALYs with sacral nerve stimulation.

The cost of sacral nerve stimulation was EUR 25,780, compared with EUR 19,353 for botulinum toxin A; an additional EUR 6,428 with sacral nerve stimulation.

The incremental cost-effectiveness of sacral nerve stimulation was EUR 27,991 per QALY gained.

Sacral nerve stimulation was cost-effective at a willingness-to-pay threshold of EUR 40,000 per QALY in 88% of simulations. The sensitivity analyses revealed some scenarios where sacral nerve stimulation was not cost-effective, such as if botulinum toxin A could be provided under local anaesthetic.

Authors' conclusions
The authors concluded that sacral nerve stimulation was cost-effective over five years, compared with botulinum toxin A, except in some scenarios, such as if botulinum toxin A was administered under local anaesthetic.

CRD commentary
Interventions:
The interventions were described and appear to have been appropriate comparators. They were reported to be common practices in the study setting.

Effectiveness/benefits:
It was not clear if a systematic review of the literature was undertaken making it unclear if all the best available evidence was used. Little information was provided on the included studies making it difficult to assess their quality. The derivation of the utility estimates, used to calculate the QALYs, was briefly described and seems to have been appropriate; the reference was given.

Costs:
The authors stated that the perspective was societal, but only the direct costs of health care and treatment were included and the costs might have been underestimated. The sources for the cost data were appropriate to the setting, but those for resource use were not reported, making it difficult to assess their quality. The authors reported adjustments to the cost data, such as the discount rate, and provided the currency and price year, which appear to have been appropriate.

Analysis and results:
The analytic approach appears to have been appropriate and a diagram was provided. The results were appropriately combined in an incremental analysis to compare the two treatment pathways. The impact of uncertainty on the results was sufficiently explored in both one-way and probabilistic sensitivity analyses. The authors reported a number of limitations to their analysis.

Concluding remarks:
The results were reported well. The methods were satisfactory, but not fully reported, making it difficult to assess the authors' conclusions.

Funding
Funded by WAMU (wetenschappelijke activiteiten Maastrichtse Urologie), which is supported by Novartis, Medtronic (manufacturer of a sacral nerve stimulator), GlaxoSmithKline, Coloplast, AstraZeneca, Astellas, and Abbott.

Bibliographic details

**PubMedID**
21166750

**DOI**
10.1111/j.1464-410X.2010.09905.x

**Original Paper URL**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Botulinum Toxins, Type A /economics /therapeutic use; Chronic Disease; Cost of Illness; Cost-Benefit Analysis; Electric Stimulation Therapy /economics /methods; Humans; Lumbosacral Plexus; Neurotransmitter Agents /economics /therapeutic use; Quality-Adjusted Life Years; Treatment Outcome; Urinary Bladder, Overactive /economics /therapy

**AccessionNumber**
22011001454

**Date bibliographic record published**
20/10/2011

**Date abstract record published**
08/02/2012