Is DaTSCAN cost-effective as a diagnostic tool in uncertain Parkinson’s?

Appraised by Kevin Galbraith, 11 February 2016

Update due 2019

Background
Parkinson’s can be difficult to differentiate from other parkinsonian syndromes or essential tremor. DaTSCAN, which measures the density of nigrostriatal dopamine transporter sites, may in some cases help the clinician make the correct diagnosis. This CAT looks at the cost-effectiveness of DaTSCAN as a diagnostic test.

Search terms
(Ioflupane OR FP-CIT OR DaTSCAN OR DaTscan OR DaT-SPECT OR dopaminergic imaging) AND (Parkinson Disease / OR Parkinson$) AND cost-effectiveness

Search strategy
Ovid Medline, and Cochrane Library from 1996 to February 2016.

Evidence
The search yielded three articles,1-3 all critically appraised below.


Clinical bottom line
1. No assessments of cost-effectiveness from the perspective of the UK healthcare system were found in the published literature.

2. Cost-effectiveness analyses from Belgium, Italy and Germany all found that inclusion of DaTSCAN in the diagnostic workup of patients with uncertain parkinsonism yielded gains in patient time on adequate treatment. The Italian study found a cost saving. The other two studies presented net costs. In these cases, decisions on funding the inclusion of DaTSCAN will depend on the willingness of providers to pay the given costs.

3. Such decisions in a UK context require better evidence from locally applicable economic analyses.
Summary

A cost-effectiveness analysis of DaTSCAN in patients with an uncertain diagnosis of parkinsonism, from the perspective of the Belgian healthcare system. A theoretical Markov state transition model was created, based on data derived from the medical literature, and consensus among a Delphi panel of 13 neurologists and nuclear medicine specialists. As the model was found to be sensitive to alternative values for prevalence of parkinsonism, its predictive validity was tested, and confirmed, by comparison with objective observations from a national registry comprising 1,701 consecutive patients who had received a DaTSCAN. It was estimated that use of DaTSCAN would result in a change of management in 48.5% of patients, and over a five-year period, 1.2 adequately treated years (ATY) would be gained per patient, at a yearly additional cost of €72 (currently £52). The authors concluded that use of DaTSCAN in the diagnostic workup of patients with uncertain parkinsonism yields a highly significant and favourable impact on patient management, at a marginal cost to the healthcare system. The following points should be noted:

• It was unclear how the Delphi panel arrived at a consensus for the costs of diagnosis, treatment and adverse events.

• The extent to which findings might be extrapolated to our own (UK) healthcare system would depend on an assessment of comparative costs and clinical management in the two countries.

• The study addressed an important, clearly focused question; the choice of study design was appropriate; ATY was an appropriate measure; assumptions were explicit, vindicated by comparison with objective data; and appropriate sensitivity analyses were conducted.

Overall assessment of study: acceptable (+)*

* Scottish Intercollegiate Guideline Network. Methodology checklist 6: Economic Evaluations. Options for overall assessment: high quality (++); acceptable (+); unacceptable – reject 0.

Summary
A cost-effectiveness analysis, from the perspective of the German healthcare system, of a variety of diagnostic strategies using DaTSCAN, among patients with suspected Parkinson's referred to a specialist movement disorder clinic. A decision-tree model was constructed to predict adequate treatment month equivalents (ATME) and the incremental cost-effectiveness ratio (ICER) over a 12-month time horizon. Compared to total reliance on clinical examination, using DaTSCAN to confirm a diagnosis of Parkinson's after a positive clinical examination cost €733 per ATME gained. The authors concluded that if DaTSCAN is included in the diagnostic workup of patients referred to a movement disorder clinic, with a high prevalence of Parkinson's, it should be used as a confirmatory diagnostic test in patients who have a positive clinical examination. If, however, the decision-maker is not willing to spend €733 for the equivalent of a patient month on adequate treatment, the diagnostic workup should include only clinical examination.

The following should be noted:

- Discounting of future costs was not carried out, but this was presumably because of the 12-month time horizon.
- Sensitivity analyses were robust to a number of explicit assumptions.
- The decision-tree model was validated by a panel of clinical experts. Data were from the literature after an appropriate systematic search.
- Outcomes (ATME) were weighted on the basis that inappropriate treatment of patients without Parkinson's was more harmful than failing to treat patients with Parkinson's. All six members of an expert panel agreed on this assumption.

- A time horizon of 12 months assumed that the correct diagnosis would be established by this time in all patients. This may be optimistic, and may have biased the study against DaTSCAN. The study did not account for long-term benefit from early treatment, which would increase cost-effectiveness further.

- As with the previous two studies, the extent to which findings might be extrapolated to our own (UK) healthcare system would depend on an assessment of comparative costs and clinical management in the two countries.

Overall assessment of study: acceptable (+)∗

∗ Scottish Intercollegiate Guideline Network. Methodology checklist 6: Economic Evaluations. Options for overall assessment: high quality (++); acceptable (+); unacceptable – reject 0.

References


The UK Parkinson’s Excellence Network is the driving force for improving Parkinson’s care, connecting and equipping professionals to provide the services people affected by the condition want to see.

The tools, education and data it provides are crucial for better services and professional development.

The network links key professionals and people affected by Parkinson’s, bringing new opportunities to learn from each other and work together for change.

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