NHS England

Clinical Commissioning Policy Proposition: Deep Brain Stimulation for Refractory Tourette Syndrome in adults

Prepared by NHS England Specialised Services Clinical Reference Group for Neurosciences CRG

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1 Executive Summary

Equality Statement

Promoting equality and addressing health inequalities are at the heart of NHS England's values. Throughout the development of the policies and processes cited in this document, we have:

- Given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant protected characteristic (as cited under the Equality Act 2010) and those who do not share it; and
- Given regard to the need to reduce inequalities between patients in access to, and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities

Plain Language Summary

About Tourette Syndrome

Tourette Syndrome is a condition that starts in childhood, affecting the brain and nervous system characterised by multiple motor tics (sudden, repetitive, non-rhythmic movements) and at least one vocal tic. These tics tend to be preceded by an unwanted urge or sensation in the affected muscles.

About one in a hundred people are affected but most cases are mild and/or spontaneously improve as they pass into adulthood. Severe cases may require medication but a small number of patients do not respond to the drugs prescribed nor appear to improve as they get older.

About current treatments

Behavioural therapy is usually the first approach to treatment. If this is unsuccessful medicine may be given; using drugs developed for the treatment of mental health conditions such as psychosis. In some cases muscle relaxing treatments are used.

About the new treatment

Among the patients with tics that persist into adulthood, a few individuals are severe. Among these, there is a small group of patients who do not respond to the medicines or cannot tolerate them. Deep Brain Stimulation (DBS) is already used in the NHS for movement disorders such as Parkinson's Disease and dystonia. DBS represents a treatment option for a small group of patients who do not respond to other treatments.

What we have decided

NHS England has carefully reviewed the evidence to treat Tourette Syndrome, which is resistant to other treatments (refractory), with Deep Brain Stimulation in adults. We have concluded that there is not enough evidence to make the treatment available at this time.

2 Introduction

This document describes the evidence that has been considered by NHS England in formulating a proposal to not routinely commission Deep Brain Stimulation for Refractory Tourette Syndrome in adults.

For the purpose of consultation NHS England invites views on the evidence and other information that has been taken into account as described in this policy proposition.

A final decision as to whether Deep Brain Stimulation will be not routinely commissioned will made by NHS England following a recommendation from the Clinical Priorities Advisory Group.

3 Proposed Intervention and Clinical Indication

Tourette syndrome is defined as the presence of multiple motor and vocal tics, starting in childhood and persisting for more than 1 year.

Many patients with mild Tourette syndrome may be adequately treated simply by providing information and reassurance, and may undergo spontaneous remission. In patients disabled by persistent motor and vocal tics, behavioural interventions and/or pharmacological interventions can lead to satisfactory symptom control. Additional treatment may be required for coexisting obsessive compulsive disorder, attention deficit hyperactivity disorder, and mood disorders such as depression.

Patients with persistent disability due to severe motor or vocal tics, despite adequate treatment trials of behavioural and/or pharmacological therapies may be considered for eligibility for Deep Brain Stimulation surgery.

Deep Brain Stimulation is a neurosurgical procedure which involves the precise placement of 2 long, thin (1.27mm diameter) electrodes into deep structures within the brain. These electrodes are connected to an implantable pacemaker which is usually sited under the skin on the chest wall. The system can be programmed to deliver tiny amounts of electrical stimulation to precise brain regions with initial

repeated adjustments required to derive optimum beneficial effects while avoiding unpleasant or unwanted effects.

The implantable pacemaker lasts for between 2 and 6 years depending on the amount of electricity required. Patients requiring frequent pacemaker changes can be considered for a rechargeable system that can last for up to 25 years.

Deep Brain Stimulation should only be performed in specialist centres with experience of stereotactic neurosurgical techniques and a multidisciplinary team including functional neurosurgeons, neurologists, neuropsychologists, neuropsychiatrists and specilaist nurses.

The optimal brain target for stimulation remains uncertain. The majority of patients have undergone deep brain stimulation targeting the globus pallidus internus (GPi) or the Centromedian nucleus of the thalamus (CMPf). Given that it is likely that tics emerge as a result of a dysfunctional basal ganglia network, it might be expected that beneficial effects can occur by manipulating neuronal firing patterns at more than 1 point in this network.

4 Definitions

Deep Brain Stimulation: a surgical procedure involving the implantation of a neurostimulator, which sends electrical impulses to specific targets in the brain.

Tourette Syndrome: a neurological condition characterised by multiple motor tics and at least one vocal tic.

Tics: sudden, repetitive, non-rhythmic movements preceded by an unwanted urge or sensation in the affected muscles.

Severe Tourette Syndrome is defined as tics causing functional disability and accompanied by a score on the Yale Global Tic Severity Scale >35/50.

Treatment refractoriness is defined in accordance with published recommendations

by Schrock et al. 2015, as; 1. Failed treatment trials from 3 pharmacological classes: a) alpha-adrenergic agonist, b) 2 dopamine antagonists (typical & atypical), c) a drug from at least one additional class (eg, clonazepam, tetrabenazine). 2. A trial of behavioural therapy using Comprehensive Behavioural Intervention for Tics (CBIT) should have been offered or considered.

5 Aims and Objectives

This policy proposition considered: a treatment for patients who are not receiving benefit from existing treatments.

The objectives were to: to consider the available evidence and inform the policy position

6 Epidemiology and Needs Assessment

Approximately, 1% of the population under age 18 has Tourette's Syndrome (Robertson 2008). The majority have mild symptoms and those with a more severe condition generally respond to medication and/or get better spontaneously as they get older, although tics do not usually completely disappear..

Patients with severe, medication refractory Tourette syndrome persisting into adulthood are rare. An estimated 5-10 patients per year would be eligible for DBS in England.

While there are formal epidemiological studies quantifying the age stratified incidence and prevalence of Tourette syndrome, there are no data that include information on disease severity and previous treatment trials.

Estimated numbers of eligible patients for DBS are therefore derived from the only 3 dedicated Tourette syndrome clinics in England. It is assumed that almost all of the severe disabling and treatment refractory Tourette syndrome sufferers in England have been referred at some point to one of these 3 dedicated specialist clinics.

An estimated 5-10 patients per year would be eligible for DBS in England based on estimates by the clinicians running the 3 dedicated Tourette syndrome clinics, on the basis of disease severity, medication refractoriness, willingness to undergo

neurosurgery, and absence of other medical or psychiatric illness that would be a contraindication to DBS surgery.

7 Evidence Base

NHS England has concluded that there is not sufficient evidence to support a proposal for the routine commissioning of this treatment for the indication.

The eight studies (see list in reference section 15) included in this Evidence Review showed an improvement in total Yale global tic severity scale (YGTSS) scores, although the degree of improvement varied quite widely. Most of the studies were limited by small sample sizes and this, together with differences in how they were conducted, limits the usefulness of the findings so that we cannot tell with any great degree of certainty, whether DBS would work in the same or similar way in any other patients with severe and difficult to treat TS.

A number of adverse events (AEs) and side effects were reported from the studies. However, these were mostly incidental findings rather than findings from studies designed specifically to look for them. As such, all we can infer is that symptoms such as lethargy and dizziness may be associated with DBS, but it is by no means certain that any of them will occur or that other AEs and side effects that have not yet been identified might be equally likely to occur.

The primary research trials included varied in their quality: the numbers of patients varied between 3 and 17, with the systematic review and meta-analysis including 162 and 150 patients respectively. One study only had 1 patient in the comparator arm (Ackermans et al., 2011) (having been stopped prematurely following an interim analysis of 6 patients who had all received evaluations ON and OFF stimulation, that revealed a statistically significant advantage of DBS). Hence the power of the studies to identify meaningful results was limited and the results presented may have been an over or under-estimate of reality. The patient characteristics were also either unclear or biased (one study had all male patients), baseline medication and changes to medication were not necessarily reported and neither were co-morbidities. The electrodes were also implanted in different locations in the brain. This means that other factors could have influenced the magnitude of the outcome responses, such as the amount of improvement in YGTSS score, apart from the

DBS.

8 Proposed Criteria for Commissioning

Not applicable as not for routine commissioning policy

9 Proposed Patient Pathway

Patients would follow the current pathway for treatment of Tourette syndrome.

10 Proposed Governance Arrangements

Not applicable as not for routine commissioning policy.

11 Proposed Mechanism for Funding

Not applicable as not for routine commissioning policy.

12 Proposed Audit Requirements

Not applicable as not for routine commissioning policy.

13 Documents That Have Informed This Policy Proposition

Not applicable

14 Date of Review

This document will lapse upon publication by NHS England of a clinical commissioning policy for the proposed intervention that confirms whether it is routinely or non-routinely commissioned.

15 References

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