Treating and preventing migraine by magnetic stimulation of the brain

Information for the public
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What has NICE said

NICE has looked at using transcranial magnetic stimulation (TMS) during the aura before or at the start of a migraine attack, with the aim of stopping or reducing the severity of the attack ('treatment'), or at planned intervals, with the aim of reducing the frequency and/or severity of attacks ('prevention').

There is not much good evidence about how well this procedure works in the treatment of migraine, or how well it works and how safe it is to use it frequently or in the long term for preventing migraine. It should only be used if extra care is taken to explain the risks and extra steps are put in place to record and review what happens.

A specialist headache clinic should decide which patients should be offered this procedure and it should only be used under the direction of doctors specialising in managing headaches. Patients should be told that the procedure is not intended to cure migraine and reduction in migraine symptoms may be moderate.

More research on magnetic stimulation of the brain for treating and preventing migraine is needed.

What does this mean for me?

Your health professional should fully explain what is involved in having this procedure and discuss the possible benefits and risks with you. In particular, they should explain the uncertainty about the evidence on how likely it is to improve your symptoms and possible side effects. You should also be told how to find more information about the procedure. You should only be asked if you want to agree to this procedure after having this discussion.

Your health professional may ask you if details of your procedure can be collected.

Other comments from NICE

NICE said that the procedure might be useful for patients who want or need to reduce or stop taking drugs for their migraine, for example during pregnancy.

The condition

Migraine is a severe recurrent headache often associated with nausea and sensitivity to light and sound. Some patients have some form of warning (an 'aura'), which can include visual disturbances, an imagined unpleasant smell or difficulties with speech, before the headache starts. The usual treatment for migraine is drugs such as triptans which can stop a migraine developing, and painkillers and anti-sickness drugs to help with symptoms. Other treatments such as nerve blocks, botulinum injections and acupuncture are sometimes offered.

The NHS website may be a good place to find out more.

NICE has looked at using magnetic stimulation of the brain as another treatment option. Click on to the next page to find out more.

The procedure

Transcranial magnetic stimulation (TMS) is a non-invasive procedure using a tabletop or

handheld device. The device is placed on the scalp and either single (sTMS) or repeated (rTMS) magnetic pulses are delivered. The frequency, intensity, duration and interval times of pulses can be varied. The device automatically records treatments in an integrated headache diary, which patients can use to identify headache patterns and trigger factors. Patients can carry on taking regular medications, including drugs to prevent migraines.

Benefits and risks

When NICE looked at the evidence, it decided that although the procedure can reduce pain and the number of migraine attacks it was not clear how often it should be used or what the best combination of magnetic pulses was. It decided that although the procedure was safe to use in the short term, there was not enough evidence about how safe it is in the long term or when used often. The 5 studies that NICE looked at involved a total of 332 patients.

Generally, they showed the following benefits:

- in a study of 164 patients who had the single TMS procedure or a 'sham' procedure during a migraine attack, the 82 patients who had the TMS procedure found that their pain improved more after treatment than the 'sham' group
- in a study of 51 patients whose migraines were not helped by drug treatment, the repeated TMS procedure reduced the number of migraine attacks by half for up to 4 weeks
- in a study of 27 patients, of whom 14 had the TMS procedure and 13 had a 'sham' procedure, the number of migraine attacks and the numbers of hours and days with migraine over an 8-week period were reduced within both groups, but this was less likely to have happened by chance in the TMS group.

The studies showed that:

- there were no serious risks associated with having the procedure
- a very few patients had slight dizziness, drowsiness, tiredness, muscle tremor causing difficulty standing, irritability, vivid dreams and sensitivity to sound, none of which needed treatment.

NICE was also told about some other possible risks:

- short-lasting muscle contraction
- pain where the pulses are given
- effects on hearing.

In theory, other risks include local scalp irritation, mood disorders, cognitive impairment, triggering of epilepsy or seizures during treatment and permanent neural changes.

If you want to know more about the studies see the guidance. Ask your health professional to explain anything you don't understand.

Questions to ask your health professional

- What does the procedure involve?
- What are the benefits I might get?
- How good are my chances of getting those benefits? Could having the procedure make me feel worse?
- Are there alternative procedures?
- What are the risks of the procedure?
- Are the risks minor or serious? How likely are they to happen?
- What care will I need after the procedure?
- What happens if something goes wrong?
- What may happen if I don't have the procedure?

About this information

NICE interventional procedures guidance advises the NHS on the safety of a procedure and how well it works. This information applies to people who use the NHS in England, Wales, Scotland and Northern Ireland.

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