
Executive summary

Health Council of the Netherlands. Transcranial magnetic stimulation in psychiatry and neurology. The Hague: Health Council of the Netherlands, 2008; publication no. 2008/21

Does Transcranial Magnetic Stimulation have any effect?

Various institutions have recently begun using a new medical technique. It involves placing a magnetic coil (which generates a magnetic field) on a patient's skull. The aim is to use this magnetic field to influence processes in the brain. This technique is known as Transcranial Magnetic Stimulation or TMS.

The technique is used to ameliorate certain psychiatric symptoms. Research is also under way to determine whether it could be used to treat various neurological diseases. TMS is also a useful tool in brain research.

Is it a practical addition to the existing arsenal of interventions? This is the topic of this horizon scanning/early warning report. It was drafted by a Health Council standing committee which specialises in the evaluation of innovative medical treatments.

Promising results in the treatment of depression

A meta-analysis of 30 selected publications revealed that TMS therapy has beneficial effects in the treatment of depression. This impression is confirmed by one methodologically very sound study in particular, which was reported in the most extensive publication in the meta-analysis. There are no indications that the electromagnetic field causes any adverse side effects which might limit the therapeutic usefulness of this technique.

To date, the only evidence of this technique's usefulness involved treatments lasting just a few weeks. Nevertheless, the results obtained with these patients, who had previously failed to respond to medication, were very encouraging. It seems likely that other groups of patients could also benefit from this new intervention, and that a more protracted period of treatment or increased stimulation might produce still greater improvements.

That is promising, because this local intervention represents an entirely new approach to the treatment of depression. Importantly, the body is not exposed to foreign substances which affect the entire system.

Less evidence of benefits with other indications

Some beneficial effects were also identified in a meta-analysis focusing on this technique's use in connection with hallucinations. That work involved the use of TMS as a treatment for auditory hallucinations in schizophrenic patients who 'hear voices'. Here too, the patients in question had previously shown little or no response to medication. Treatment with TMS resulted in significant reductions in these patients' symptoms. However, the studies examined in this connection were both fewer in number and more restricted in scope than in the case of depression.

In addition, TMS is already being used to assist the recovery of patients who have suffered a stroke. As yet, however, few articles have been published on this topic. The limited amount of work published to date reveals only short-term, marginal improvements.

The use of TMS to treat patients with Parkinson's disease has produced some encouraging results. This technology could be useful in identifying the best site for deep brain stimulation. Whether or not TMS has the potential to reduce tremors is still open to question.

TMS might also be indirectly useful in connection with the treatment of anti-social personality disorder, by making these difficult-to-treat patients more amenable to psychotherapy. However, this option requires further investigation.

Efficacy study required

While the application of TMS appears to be relatively inexpensive, nothing is yet known about its actual cost-effectiveness. Efficacy studies should focus, in particular, on the use of TMS to treat patients suffering from depression who are not responding well to medication. This might also usefully be combined with the development of guidelines for medical professionals in the Netherlands. In this context, it would also be useful to study the longer term effects of TMS therapy.
