Transcranial magnetic stimulation (TMS): should we officially include this form of treatment?

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A local daily[1] reported few years back about a technique for aiming ultrasonic pulses at specific areas of the brain to induce 'sensory experiences' such a smells, sounds and images. This was quoted as an improvement over an existing non-surgical method known as transcranial magnetic stimulation. Since ages, electroconvulsive therapy (ECT) is being used for treating some psychiatric conditions. This procedure is invasive in the sense that anaesthesia and muscle relaxants are used which could have their potential side effects. Transcranial Magnetic Stimulation (TMS)[2] was first developed in 1985 and being used by few centers around the world. Its public use in Pakistan is largely unknown though there are some anecdotal reports of its use in one or two centers. It is a technique of gently stimulating the brain utilizing a specialized electromagnet placed on the patient's scalp that generates focused magnetic pulses. It reduces brain activations and stimulates at higher frequencies. It is used for patients with major depression of refractory nature and its use in other psychiatric and neurologic disorder is being investigated. FDA has yet not approved TMS for any psychiatric treatment at the present time. In Canada, it has been approved for treatment of depression among patients who have not responded to medications. The researchers are focusing their interest because of its unique features like: being non-invasive, can easily be focused on small areas of brain and can change brain activity. Historically, the therapeutic potential of TMS was not realized until the repetitive stimulator (rTMS) which can generate up to 30 pulses per second was available in 1990s. The side effects of rTMS include mild headache which responds to mild analgesics, and potential hearing damage, which can be prevented with ear plugs. It appears that the long term side effects are unlikely.[3] Its role in treatment of depression has been explored while it is yet not clear how TMS may help relieve symptoms of depression. Networks of brain regions are thought to play a role in mood regulation. Researchers are still trying to determine the best dosage stimulation and the best are to stimulate.[4] The National Institute for Health and Clinical Excellence (NICE)[5] in their guidance mentions "current evidence suggests that there are no major safety concerns associated with TMS for severe depression. There is uncertainty about the procedure's clinical efficacy, which may depend on higher intensity, greater frequency, bilateral application and/or longer treatment durations that have appeared in the evidence to date. TMS should therefore be performed only in research studies designed to investigate these factors." The TMS was found equally effective as ECT in population with depression but no psychosis.[6] In terms of cost, a study concludes that ECT is more cost-effective than rTMS in the treatment of depression.[7] Regarding its comparative efficacy, Eranti S et al[8] had mentioned that rTMS was not as effective as ECT; a rebuttal in the form of correspondence by Janicak et al[9] had raised concerns about limitations of the study in question and indicated that it was premature to conclude that ECT was more effective in non psychotic patients with depression. They suggested a need for large, randomized trial in ECT-naïve patients that also examines potential predictors of response. It has been demonstrated that rTMS has, compared to unilateral ECT no adverse memory effects.[10] A novel form of treatment called magnetic seizure treatment (MST) in which stimulation parameters are reached that can reliably and reproducibly induce therapeutic seizures in the same setting as the one used for ECT has been developed.[11] A recent trial comparing ECT with MST demonstrates fast recovery of orientation and superiority over ECT on measures of attention, retrograde amnesia and category fluency.[12] With the ongoing research on TMS, so far it has been said that its use is divided into two broad categories: diagnostic and therapeutic. For diagnostic purposes, it has a role in stroke, spinal cord injury, multiple sclerosis and motor neuron disease. Plasticity of brain can also be measured now with rTMS as abnormality in

plasticity is the cause of abnormality in a number of conditions. A number of conditions where its usefulness is being established or is under investigation are: stroke, non-fluent aphasia, tinnitus, Parkinson's Disease, dystonia, amyotrophic lateral sclerosis, epilepsy, migraine, dysphasia, hemispatial neglect, clinical depression, phantom limb, chronic pain, obsessive-compulsive disorder and auditory hallucinations associated with schizoaffective disorders.[13] The Royal Australian and New Zealand College of Psychiatrists[14] (RANZCP) have issued a position statement on this subject. "According to this position paper: there are potential benefits of rTMS without incurring the main side effects of ECT, TMS machines are classified as 'listable' electromagnetic devices. RANZCP accepts the responsibility for making recommendations concerning the use of rTMS in clinical psychiatry and for monitoring such use, majority of controlled and uncontrolled studies, but not all, have demonstrated a positive effect in depression, treatment of longer duration may be effective, safety and side effects of rTMS have been extensively studied. It is viewed favourably by recipients of the treatment. Patients for whom rTMS might be offered outside a research protocol should include, those suffering from major depression who have failed or who are intolerant of other suitable treatments, also the previous responders to rTMS who have relapsed and are not eligible for an existing research protocol, those whose clinical presentation suggests that ECT is indicated but who prefer to try rTMS before ECT, or for whom ECT might present an unusually high risk. Additionally, the recommendations are: patients with a history of epilepsy or with surgically implanted metal in the head or neck should not have rTMS, in view of the absence of efficacy and safety data in pregnancy, pregnant women should not have rTMS outside of a properly conducted and ethically approved clinical trial. Careful decision should be taken for patients under age 18, until further information is available psychiatric illnesses other than depression should be treated with rTMS within approved research protocol. Informed consent should be obtained from the patient before administering rTMS, it should only be performed in a hospital setting , should be administered by trained medical practitioners and psychiatrists should be properly trained before application of this treatment modality. Still much research is required to establish its place in the management of psychiatric illness". It appears that though this modality of treatment is still under the research umbrella, it is being used on patients at a number of regions of the world without adverse reports. While Higher Education Commission of Pakistan (HEC) is spending liberally on research and its tools, it would not be too ambitious to include TMS in the list. A local protocol and guideline can be developed by the College of Physicians and Surgeons of Pakistan (CPSP) along with arrangements of training for psychiatrists. However, initiative can now be taken by the Pakistan Psychiatric Society (PPS) in making a proposal for HEC. Let's keep our fingers crossed for beneficial results among our patient population.

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