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Letter to the Editors

Is rTMS efficient as a maintenance treatment for auditory verbal hallucinations? A case report

Dear Editors,

Auditory verbal hallucinations (AH) occur frequently in schizophrenia; in 25% of cases, they are resistant to antipsychotic medication (Shergill et al., 1998) and can produce significant distress and behavioural difficulties. Low frequency (1-Hz), extended duration repetitive Transcranial Magnetic Stimulation (rTMS) could reduce excitability in the brain region directly stimulated as well as in other functionally connected brain areas (Wassermann, 1998). An over-activation of the left temporoparietal cortex, which is critical to speech perception, has been implicated in the genesis of AH (Lennox et al., 2000; Brunelin et al., 2006) and is readily accessible to rTMS. Suppressive 1-Hz rTMS delivered to this area may therefore produce sustained reductions in AH. It has been reported that about 10,000 stimulations delivered in 10 sessions may temporarily curtail refractory AH (Hoffman et al., 2003, 2005; Poulet et al., 2005). Indeed, the duration of this effect is variable; Hoffman et al. (2005) reported that the mean duration of survivorship was roughly 4 months, where survivorship was defined as a sustained reduction in hallucination severity of at least 20% relative to pre-trial baseline scores. In rTMS treatment of bipolar depression, Li et al. (2004) reported the efficiency of a 1-day-per-week maintenance treatment during 1 year. Our objective was to evaluate the efficiency of rTMS on AH improvement with a once-weekly maintenance treatment.

In May 2004, a 50-year-old right-handed female patient with DSM IV diagnosis of schizophrenia (illness duration: 23 years) and resistant AH was included in a rTMS protocol after giving her written informed consent following a detailed description of the study and after undergoing screening of all rTMS contraindications. Stimulation was delivered at 100% of motor threshold (MT) on a location situated midway between the left temporal (T3) and left parietal (P3) electroencephalogram electrode sites, according to the international 10–20 system. Stimulations were carried out to the left temporoparietal cortex with a Medtronic Mag PRO® (Medtronic-Boulogne-France) stimulator system, with figure-eight 70-mm coils. During rTMS courses, the patient still received her current antipsychotic medication (300 mg clozapine/day). AH were weekly assessed using a seven-item French version of the Auditory Hallucination Rating Scale (AHRS, range 0–41; see Hoffman et al., 2003), positive symptoms by the SAPS. Results were given as mean scores per month (four assessments). At base line, the patient presented a score of 23 on AHRS. After a first course of 10,000, 1-Hz rTMS (1000 stimulations/day during 10 days), AH were moderately improved (−30% in AHRS). Thus, a second course of 5000 stimulations was delivered over 5 days to obtain a better improvement. AH were greatly improved (−50%) after this second course. SAPS score moderately improved from 50 to 45. However, 1 month later, hallucinatory symptoms reappeared, but at a lesser intensity (80% of baseline on AHRS). AH did neither improve nor worsen during 5 months follow-up, SAPS score return to the baseline level.

In February 2005, the patient had relapsed and again presented a base line score of 23 on AHRS. A new rTMS course was conducted (with the same parameters, i.e. 10,000 stimulations on 10 consecutive working days at 100% MT; after a second definition of MT). This second course was followed by a weekly maintenance stimulation protocol (1-Hz-1000 stimulations at 100% MT each Wednesday). After the new

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course of rTMS, AH were greatly improved (− 50%) and SAPS score decreased from 51 to 35. Weekly maintenance course permitted a stabilisation of AH scores at 80% measured by AHRS for 6 months, with a stabilisation of SAPS scores at 40.

With this maintenance protocol, the improvement on AH measured by AHRS scores does not exceed 20%. Thus, this weekly stimulation protocol seems not to be efficient in maintaining the improvement, which was twice observed after an rTMS course (− 50%). After each course, with or without maintenance stimulation, symptoms reappeared one month later with a lesser intensity (80%). Thus, we could rather consider a 10,000 rTMS course on a 1-week-per-month basis (adjustable, case by case) instead of the described 1-day-per-week maintenance protocol. As well as described in the rTMS treatment of major depression disorder (Dannon et al., 2000) we reported that a second rTMS course is more quickly efficient in schizophrenic patient with AH. To obtain an improvement of 50% in the first course, the patient needed 15,000 stimulations, whereas 10,000 were enough in the second course. Clinical response to rTMS might itself be a predictor of the success of future treatment. rTMS produces significant clinical improvement measures by SAPS scores in patients who have previously responded to rTMS but have since relapsed. Other maintenance protocol is required to investigate the interest of such maintenance therapeutic method, which seems to be efficient in mood disorder (Li et al., 2004).

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