



SHORT COMMUNICATION

Use of repetitive transcranial magnetic stimulation for the management of bipolar disorder during the postpartum period

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Postpartum mood disorder, including depressive, manic or mixed episodes, is relatively common, occurring in up to 20% of women.¹ It has a significant impact on infants and children, as it may affect bonding, therefore having consequences to infants' emotional and neurologic development.² Another potential deleterious consequence is the use of psychiatric drugs during lactation because most of them pass into the breast milk. Given the importance of breastfeeding during the first 6 months of life and the importance of treating mood disorders in the postpartum period, novel treatments that are not harmful to infants are needed. One option is transcranial magnetic stimulation (TMS).

TMS is a relatively simple device in which a strong, varying magnetic field induces electric currents into the brain that can modulate activity if applied repetitively. Several clinical trials on repetitive TMS (rTMS) and depression have been performed and a recent meta-analysis showed that rTMS induces a significant antidepressant effect compared with placebo.³ In addition, rTMS has also been tested for the treatment of mania; however, results are mixed: few studies show positive results,^{4,5} however, a randomized sham-controlled study showed that active rTMS was not different than sham rTMS in treating mania

symptoms.⁶ To date no systematic studies have assessed the therapeutic effects of rTMS on mood during the postpartum period. We describe a case report in which rTMS was successfully used to control an episode of mania during postpartum and thus could eliminate the need for psychotropic drugs during the initial 6-month period of breastfeeding.

Case report

A 36-year-old woman on the 20th postpartum day was referred to our office because of increased energy levels, being restless, having psychomotor agitation, irritability, pressure of speech, reduced need for sleep (1 hour per night), and flight of ideas. She had a long history of depressive, manic episodes and mixed episodes. Her first episode occurred at the age of 22 years. She has had at least five episodes since that time and was relatively stable for 3 years with the use lithium with a dosage of 900 mg per day until she became pregnant and her physician interrupted the lithium treatment.

At 5 months of pregnancy, she had an episode of increased sadness, insomnia, and irritability. She had a diagnosis of moderate depression. Further evaluation showed Hamilton Depression Rating Scores (HDRS) of 18 and Young Mania Rating Scale (YMRS) of 4. To avoid use of medications, she was prescribed with a session of 1 Hz rTMS of the right dorsolateral prefrontal cortex using an intensity of 100% of motor threshold with 1600 pulses. Because she had a remarkable response to this single session of rTMS, additional rTMS

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sessions were not indicated. Indeed, in the new assessment after 2 weeks, she had complete remission of depression symptoms (HDRS of 6 and YMRS of 2).

She remained stable with no symptoms for the rest of her pregnancy until she was brought to our office on the 20th postpartum day when she presented with symptoms of mania: speech pressure, restlessness, and decreased need for sleep. Evaluation at this time revealed HDRS of 8 and YMRS of 35. Because of the diagnosis of mania and to avoid the use of medications, it was indicated one session of high-frequency 20 Hz rTMS of the right dorsolateral prefrontal cortex, 1600 pulses using 100% of motor threshold. She had a remarkable improvement of mania symptoms and 3 days later she returned with symptoms of depression: sadness, depressed mood, feelings of guilt, and difficulty concentrating with no psychotic symptoms. Evaluation showed YMRS of 10 and HDRS of 22. Because of this rapid cycling episode and her previous history of mixed episodes, it was decided to proceed with bilateral high-frequency 20 Hz rTMS (800 pulses on the left and 800 pulses on the right dorsolateral prefrontal cortex) using 100% of motor threshold. This approach was maintained weekly up to the fifth session and then twice a month for 1 month and once a month for 2 months, with a total of 10 sessions. Since the initial sessions, she has had an extraordinary improvement of both depression and manic symptoms (Figure 1) and has remained stable.

One month after the end of treatment (6 months after delivery), it was decided to add lithium again as for a long-term maintenance treatment, therefore breastfeeding was substituted by milk and modified diet.

The infant had a normal neurologic development. He was born at 37 weeks and 5 days of gestation, cesarean section was indicated because of severe oligoamnio. Apgar scores at 1 and 5 minutes were 9 and 10, respectively. Neurobehavioral and neurodevelopment assessment of the infant on day 2, and after 2 and 6 months showed normal neurodevelopment.

Discussion

This case report shows a successful use rTMS for the management of bipolar disorder during pregnancy. The use of rTMS in this case avoided the use of drugs during the last trimester of pregnancy and initial 6 months of the postpartum period. We briefly discuss two important points in this case: (1) the use of bilateral high-frequency rTMS in a patient with a history of mixed episodes presenting an episode of rapid cycling, and (2) remarkable response to a single session of rTMS.

First, we adopted a novel strategy of stimulation: bilateral high-frequency rTMS as this patient presented with an episode of rapid cycling. This strategy seemed to be effective to control manic and depressive symptoms as she remained remitted during the 6-month treatment period. Bilateral rTMS has been used before but only for depression and using high and low frequency rTMS of the left and right dorsolateral prefrontal cortex, respectively.⁷ Although this treatment was effective to control this episode of rapid cycling, because this was a single case report, this result

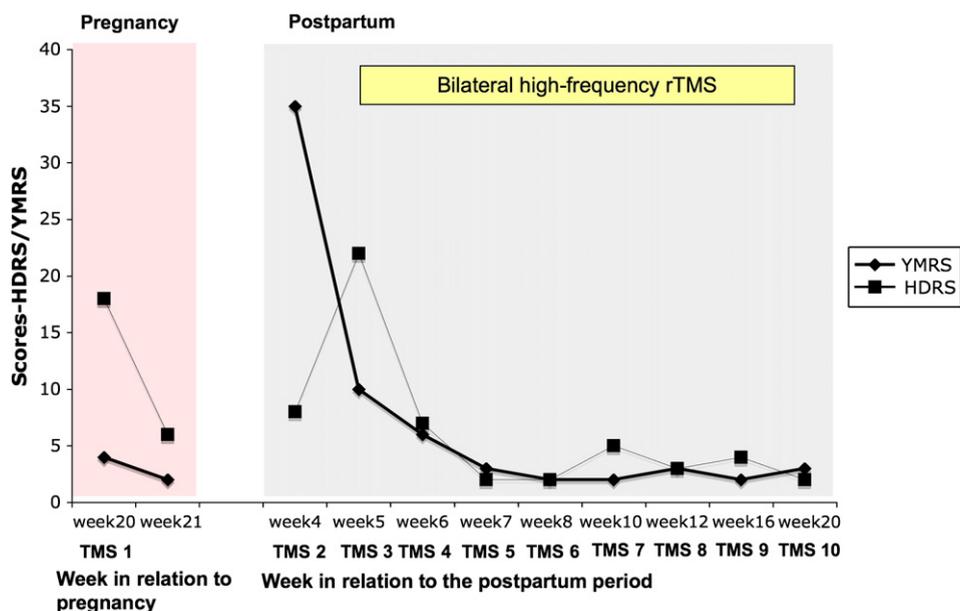


Figure 1 Hamilton Depression Rating Scores (HDRS) and Young Mania Rating Scale (YMRS) scores during pregnancy and postpartum period. During pregnancy one session of repetitive transcranial magnetic stimulation (rTMS) (1 Hz rTMS of the right dorsolateral prefrontal cortex (DLPFC) was applied at week 20. During postpartum, 10 sessions of rTMS were applied (one session of 20 Hz rTMS of right DLPFC and nine sessions of bilateral 20 Hz rTMS of right and left DLPFC). Note: “week” indicates the week in relation to the pregnancy or to the postpartum period and TMS indicates the number of the TMS session.

should be viewed with caution because this approach might have been effective for this patient only. In addition, the placebo effect needs to be considered since there was no sham treatment. However, sham rTMS, even in a prospective clinical trial, would not be ethical as lack of treatment during the postpartum period might be associated with emotional and developmental consequences to the infant.²

Regarding the weekly sessions of rTMS, several studies have reported the use of this strategy but as a maintenance treatment^{8,9}; however, in this case, the response to a single session of rTMS was relatively unusual. One of the reasons might be because this patient is not refractory to medications and therefore responds well to any type of antidepressant treatment, her past medical history showed a remarkable response to drugs. Most of the rTMS studies have been performed in pharmacologic-resistant depression¹⁰ and in addition, a study assessing 194 patients who underwent rTMS treatment for depression showed that rTMS response is directly associated with the level of treatment refractoriness.¹¹

Given previous case reports showing that rTMS might be a valuable treatment during pregnancy,^{12,13} this case report extends these findings to the postpartum period, therefore supporting and encouraging further clinical trials assessing the effects of rTMS for the management of mood disorders during the postpartum period to explore an alternative, nonpharmacologic and safe antidepressant treatment.

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