Case Report

Safety and Therapeutic Effects of Repetitive Transcranial Magnetic Stimulation and Behavior Therapy in a Pregnant Woman: Case Report

Sanaz Khomami*
Ahwaz University, Ahvaz, Iran

Reza Rostami
Tehran University, Tehran, Iran

Reza Kazemi
Lorestan University, Khorram Abad, Iran

In this study, the authors reported a case of woman with severe compulsion who became pregnant during the Repetitive transcranial magnetic stimulation. We carried out Repetitive transcranial magnetic stimulation and behavior therapy simultaneously after repeated medications' refraction. The patient received 20 sessions 1 Hz Repetitive transcranial magnetic stimulation in right dorsolateral prefrontal cortex and behavior therapy at the same time in repetitive transcranial magnetic stimulation room. We asked the patient to exposure her fear and without permission of doing usual behavior (washing), she was receiving repetitive transcranial magnetic stimulation. Repetitive transcranial magnetic stimulation and Behavior Therapy could reduce her symptoms significantly. Although her baby was healthy physically but some areas of Age and Stage Questionnaire were below than the average. Repetitive transcranial magnetic stimulation with an additional psychotherapy as behavior therapy could accelerate the improvement of Obsessive compulsive disorder's symptoms. Furthermore, using Repetitive transcranial magnetic stimulation during the first of trimester probably couldn't be safe for pregnant woman.

Keywords: Obsessive compulsive disorder, Behavior therapy, Repetitive transcranial magnetic stimulation

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Introduction

Obsessive compulsive disorder (OCD) is a disabling anxiety disorders which is characterized by obsessions (intrusive thoughts) and compulsions (ritualistic actions) and affecting 1-3% of population (1,2) . Some factors such as chemical imbalances in some areas of the brain (dysfunctioning activity in Sertonergic and noradrenergic systems) (3,4), abnormal functioning of the brain especially in Cortico Striato Pallido Thalamic (CSPT) (5), inheritance (6) and psychological reasons (7) contribute to the development of the illness. While SRIs and psychotherapy like Cognitive Behavioral Therapy (CBT) are the effective first line treatments of OCD (8), there are some stimulation methods which apply for normalization of CSPT circuits. CSPT dysregulation can target with many treatments directly or indirectly (9). Repetitive transcranial magnetic stimulation (rTMS) is a probe procedure for obsessive compulsive disorde. Few studies show positive results, but in overall the findings are controversial (9). rTMS can stimulate cortical activity directly. On the other behavior therapy can affect subcortical regions (10). So we hypothesized that stimulation of cortex (by rTMS) and subcortical regions (by Behavior Therapy - BT) simultaneously might associate with faster improvement of compulsions. We described a pregnant woman with obsessive compulsive disorder which received her acute treatment during the first trimester.

Case report: Ms M.A, a 33 year old in 2014 has been referred to ATIEH clinic (Psyche and Nerve Center, Tehran, Iran) with obsessive compulsive disorder (with washing compulsion) according to DSM- IV-TR criteria. She was a lawyer and had a lot of social stressors and mostly had family

* All correspondences to: Sanaz Khomami, email: <skhomami@ut.ac.ir>

problems especially with her husband family. She had suffered to obsessive compulsive disorder about 3 years ago (2011). She had treated with many medications (Sertraline 50mg for 4 month; Clomipramine 50mg for 1 year, Effexor 50 mg for 6 month; Paxil 40 mg for 2 month; Prozac 40 mg for 1 year). Although these medications made her feel better, but likewise the compulsion continued. When she came to our clinic (2014), her major complain was compulsion (washing) which had distributed her psychosocial functions. In ATIEH clinic, she received Luvox (100 mg daily) and her Prozac continued for her depression about 3 months. At this time she had one session's behavior therapy per week which was based on Exposure / Prevention Response. Totally her Y-BOCS before these treatments and after it were shown only 15% remissions. Hence, we decided to add up rTMS to above the treatments. Before the beginning of treatment she had completed the TASS (Transcranial Magnetic Stimulation Adult Safety Screen) form. She hadn't any seizures history, brain injury and medical problems. Of course she had an intestinal bypass surgery. Also she had an 8 year old daughter and was using a reliable method of birth control. She assessed by Y-BOCS, BAI, BDI and Social Adaptation Self evaluation (SASS). The results were shown in Table (1). We started rTMS (Magstim, Rapid 2, The Magstim Ltd., UK) over the right dorsolateral prefrontal cortex with 1 Hz frequency. The intensity was 100% motor threshold, figure 8 coil; 10 seconds duration; 2 seconds inter train; 150 trains and totally 1500 pulses per session. Before each session we asked patient to touch the toilet and sit on rTMS chair while she couldn't prevent her usual response (washing). In other words, the rTMS technician who was a psychologist guided the behavior therapy during per sessions.

Table 1. Scores of scales during and after rTMS sessions

	baseline	week 2	week 4	week 6	week 8	3 month after
Y-BOCS	20.4	35	25	28	18	20
BAI	49	43	32	24	19	22
BDI	45.9	40	26	24	21	28

About two weeks after rTMS sessions, the patient exhibited such symptoms like morning nausea, vomiting, delay in menstruations, fatigue and headache. Except the last one (headache) no symptoms associated with side effects of rTMS. With regard of this issue that patient consumed Luvox above 3 months; these symptoms couldn't be due to medications also. So she'd referred to carrying out blood and urine tests for pregnancy. Her HCG level was 985 mIU/mL and she was in 5th weeks of pregnancy. We decided to discontinue her medications. But rTMS continued with patient permission and completion a consent form for continuing. For detecting of abnormalities in chromosome and other genetic disorders, amniocentesis was performed in 20th week. There haven't shown any abnormalities.

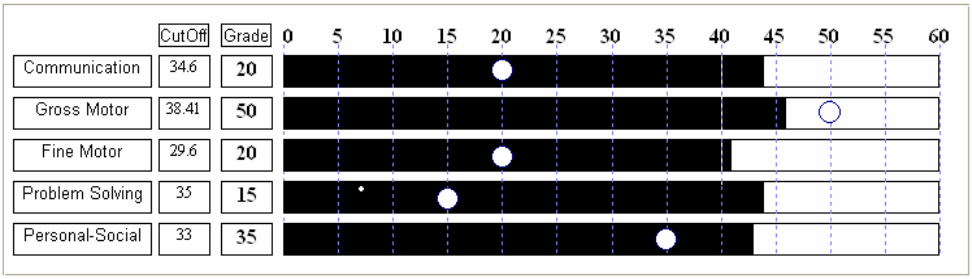

Fig 1. The sores of ASQ in 4 month baby

After the completion of 4 weeks, the patient's condition was significantly improved (more than 50% reduction in Y-BOCS). Her SASS and BDI scores also showed an improvement due to the first of treatment. Although her medications had been stopped and she had been shocked for her unwanted pregnancy, she was reporting her compulsions have been relived. The second and third trimesters passed without any problems. Finally in the week of 34, she gave birth a healthy girl. The baby weight was 2550

and 50 cm tall. Her Apgar score was 7. Her daughter didn't have any pulmonary or muscular abnormalities. Three month after the birth MS M.A came to clinic and assessed by psychiatrist. Although her Y-BOCS and BDI results weren't as the end of treatment, but they were showing a noticeably reduction before rTMS and behavior therapy. On the other, she was claiming that her baby's crying is poor and in a day she cries only 2 minutes totally. She has referred to pediatrics. Her weight at 4 months was 5600 gr and she was 59 cm tall. By ages and stages Questionnaire (18), five developmental areas assessed. There were two negative answers in communications, problem solving, personal social skills, fine motor areas but not gross motor (Figure 1). Although as the norm of ASQ for 4 months babies, her communication function was below than the standard.

Discussion

The utility of rTMS in obsessive compulsive disorder is under investigation and testing. A Cochrane systematic review showed that the data were insufficient to judge for applying rTMS in this disorder (11). Nevertheless some findings have been shown rTMS as fourth line bio treatment for obsessive compulsive disorder can induce therapeutic effects. [8] For example, in a study by Greenberg et al. there was a significant reduction in compulsion in right dorsolateral prefrontal cortex but not left or occipital area (12). Our findings also indicate that 1 Hz rTMS on right dorsolateral prefrontal cortex had therapeutic effects after 4 weeks.

To our knowledge this is the first report of therapeutic effects of rTMS in obsessive compulsive disorder with a method of psychotherapy simultaneously. In fact, we hypothesized that rTMS can stimulated the surface of cortex and behavior therapy affect some subcortical regions like caudate nucleus. In other words, by obsessive compulsive disorder model of abnormal activity, cortico-striato-pallido-thalamic pathways should be modulated (9). So response inhibition (13), planning (14) and error detection (15) are due to prefrontal cortex and stereotyped behavior (16) which originated from basal ganglion regions respectively can affect by rTMS and some methods(such as behavior therapy) which have a powerful correlation with regulation of these areas dysfunctions. In other words, rTMS with affecting of cortical regions and behavior therapy with modulating of deeper areas can accelerate the regulation of Cortico-Striato-Pallido-Thalamic circuit and finally reduce symptoms.

Furthermore, our patient became pregnant exactly during the acute treatment. Although we prescribed abortion, but medical jurisprudence didn't accept with her request because of believing that either rTMS or her medications (Luvox and Zoloft) couldn't dangerous for her fetus (It is noteworthy that, the abortion in Iran is so strictly and permission of abortion has its specified rules). Hence, we were going to continue her therapy. Our results didn't show any problems at the first of the birth, but in 4 month after baby's communications, fine motor and problem solving was below than normal. Of course, many specialists believe some items in ASQ have association with culture and training (17,18) For example, the mirror items are inappropriate because of cultural and spiritual beliefs to some families. But in this case, some items which are free from cultures and training like screaming or laughing loudly that they were also negative.

It's supposed that exposuring of pregnant woman to rTMS is prohibited unless when it is judge that the benefits are more than risks (19). Nahas and colleagues (1999) treated a woman with severe depression during the second trimester. She delivered a healthy baby (20). It seems rTMS might have particular effects on the developing brain during the first trimester. But Tan and his colleagues (2008) have reported a depressed pregnant woman who received rTMS in all trimesters. Their findings didn't show any adverse effects in baby or mother (21). Although the fact that exposuring during pregnancy with rTMS is not completely verified, but by our results, it seems that rTMS administering in the first trimester couldn't be safe.

Conclusion

Finally, this is the first study to carry out rTMS and behavior therapy the same time. This case report isn't sufficient to judge that this method have had real effects. The conclusion remains that further studies are indicated to study the efficacy of combination of rTMS and behavior therapy OCD. It sounds that although rTMS doesn't have risks for pregnant woman and her baby at the first, longer studies (maybe until preschool) is needed to verify probably long lasting of rTMS dangers.

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