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The effect of QEEG- guided neurofeedback treatment in decreasing of OCD symptoms

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Abstract

The main purpose of this research is to determine effectiveness of QEEG- Guided Neurofeedback therapy in decreasing OCD symptoms. Twelve patients were selected from «Atiyeh» institution in Tehran- Iran and they are placed in 3 situations randomly which are neurofeedback , drug therapy and waiting list. Padua Inventory is administered for all patients as pre- test and post- test in 10 weeks. The results of this research using kuruskal – Wallis and Mann-whitney U test were analysed. It's resulted that neurofeedback treatment may be used as a new treatment approach for treating OCD.

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Keywords: OCD, Neurofeedback;

1. Introduction

Obsession-compulsive disorder (OCD) is a complex and heterogeneous condition, with wide variations in symptom presentation, associated clinical characteristics, and response to treatment (Keely et al, 2008; Mc Key et al, 2004 cited of Storch & Mc Key, 2010). Treatment on OCD is unanticipative, many patients response paltry to treatment.

A study showed that after improvement of OCD with either fluvoxamine or behaviour therapy, hyperactivity of the frontal lobe decreases, and posterior brain activity increases (Nakao et al, 2005). Many studies related to qEEG, had shown that there are many secondary qEEG patterns in OCD (Hammond, 2003).

Other qEEG research has identified two subtypes of OCD patients (Mas et al , 1993). Prechep et al (1993) found one subgroup with excess alpha throughout most of the brain, but most excessive at T_3, P_3, O_1 (which would coincide with findings by kuskowski et al, 1993) and the frontal poles, along with a mild excess of beta in frontal, central and mild- temporal areas. Their other subgroup had a theta excess, most extreme throughout frontal areas and posterior temporal electrodes. Theta abnormalities have also been reported by others (Insel et al 1983; Jenik & Brotman, 1984).

However, if we could change qEEG index in patients with OCD, we can help their treatment and this work is possible with neurofeedback. Neurofeedback is a technology's answer to psychotherapy, cognitive rehabilitation,

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and poor cerebral functioning and it is a comprehensive training system that promotes growth and change at the cellular level of the brain (Demos, 2005). There are different explanations regarding the mechanism of how neurofeedback works. If one believes that individuals become aware of different EEG states and can discriminate when they are producing alpha, SMR, beta, or other frequencies, then the argument is quite simple. Individuals simply learn to produce the desired EEG pattern in appropriate setting (Schwarts & Andrasik, 2003).

EEG biofeedback (Neurofeedback) has been found to be effective in modifying brain function and producing significant improvements in clinical symptoms in several clinical areas, including epilepsy, ADD/ADHD, learning disabilities, and head injuries, anxiety, OCD (Hammond, 2003, 2005). Neurofeedback appears to have potential as a new treatment modality (Hammond, 2003).

2. Method

This research is a semi-experimental design. Among patients with OCD that referred to Atiyeh centre in Tehran city (Iran) between January 2010 and May 2010, 12 patients were selected and were placed in 3 situations randomly which were neurofeedback, drug therapy and waiting list. The groups were matched for demographics factors such as age, gender, education, and they didn't have other comorbid disorders.

Research tool was Padua Inventory that assesses both obsession and compulsion. This inventory consists of 60 items (Sanavio, 1980). Padua was used to assess symptom's intensity in clinical and normal participants. Sanavio proposed 4 factors by using of factor analysis:

1) Impaired control over mental activities
2) Urges and worries of bossing control over motor behaviour
3) Becoming Contaminated
4) Checking behaviour

In this research, first and second factors are used as an obsessive index, and third and forth factors are used as a compulsive index. Checklist of clinical interview (DSM-TV) is used to diagnose patient disorders.

After diagnosing through checklist of clinical interview (DSM-IV), Padua Inventory is completed by all subjects. In Neurofeedback situation, in order to identify therapy protocol for every patient, qEEG is taken. Neuefeedback training is performed 30 sessions (45 minutes 3 times a week) in ten week. Then, Padua Inventory is completed by these subjects, again. Drug group also completes Padua Inventory as pre-test and post-test in 10 weeks. This group is treated by SSRI medicines in ten weeks. Waiting list group also completes this inventory as pre test-post test in 10 weeks. This group is treated after research ends.

3. Results

Age means of 3 groups are almost close together (Neurofeedback=28/25, Drug, 31/75, Waiting list= 28/25). Every group consists of 2 men and 2 women.

Table 1. Kruskal-wallis test's results in pre-post scores subtraction for compulsive index

Groups	Numbers	Ranks means
Neurofeedback	4	7/00
Drug	4	9/75
Waiting list	4	2/75
Total	12	

Kruskal-Wallis Test

χsquare	7/681
Df	2
Sig	0/021

As table 1 presents, using kruskal-wallis test, results in pre-post scores subtraction for compulsive index is significant (p= 0/021). Table 2 reveals that using Mann-whitney U test does not show any significant difference between neurofeedback and drug group in compulsive index, but there is significant difference between neurofeedback and waiting list. These results indicate that neurofeedback can decrease compulsive symptom. These results also discover that neurofeedback is an effective method for compulsion (p=0/057).

Table 2. Mann-Whitney U test's results in compulsive index

Groups	Test
Neurofeedback and Drug	0/2
Neurofeedback and Waiting list	0/057
Drug and Waiting list	0/029

Table 3 presents, using kruskal-wallis test, results of pre-post scores subtraction for obsessive index is significant (p=0/024). Table 4 indicate that using Mann-whitney U test, there are not any significant differences between neurofeedback and drug therapy in obsessive index, but there is significant difference between neurofeedback and waiting list. These results show that neurofeedback can decrease obsessive symptom.

Table 3. Kruskal-wallis test's results in pre-post scores subtraction for obsessive index

Groups	numbers	Ranks means
Neurofeedback	4	8/38
Drug	4	8/63
Waiting list	4	2/50
Total	12	

Kruskal-Wallis Test

χsquare	7/446
Df	2
Sig	0/024

Table 4. Mann-whitney U test's results in obsessive index

Groups	Test
Neurofeedback and Drug	0/886
Neurofeedback and Waiting list	0/021

Drug and Waiting list	0/029

4. Conclusions

This research proves that neurofeedback training is an effective method for decreasing OCD symptoms. This research's result is consistent to Hommnd's studies (2003, 2004). Then, we can use neurefeedback for decreasing obsession and compulsion. Because of small sample, this result isn't generable. And further researches should be pursued in these areas. Unfortunately, little researches have examined this area. Neurfeedback are being able to help brain through training it until some waves increase (up training) and some of them decrease (down training). Indeed, contrary to drug therapy regulate brain, neurofeedback helps brain's self-regulation. In fact, practice mechanism is operant conditioning. People restructure and regenerate brain's waves. Firstly, changes are short-term, but these are gradually more persistent. Neurofeedback learning is similar to learning a skill. For example, Lubar (2003) resembles neurofeedback training to learning bicycling. Certainly, learning a new skill look like neurofeedback, needs high motivation. Neurofeedback is a new invasive method (Hammond, 2003).

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