Neurofeedback and treatment of obsessive-compulsive disorder

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Abstract

Psychiatric disorders are a disease that the human mind has long been involved to identify its cause and find a cure. One of these disorders is obsessive-compulsive disorder and this research tries to identify its cause and also find a cure. This study utilizes the scientific advances in therapy is trying to identify new and more effective treatments for these disorders and one of these treatments is that treatment Neurofeedback. In this therapy, people learn to use conditioning agent, change the pattern of brain wave. The results show that neurofeedback has positive impact on treating OCD obsessions.

Keywords: mental disorders, intellectual - a practical, scientific progress.
Introduction
Understanding those mental disorder that are characterized as obsessive-compulsive disorder has attracted the attention of many psychologists, psychiatrists and researchers. Obsessive-compulsive disorder consists of two parts, namely intellectual and practical obsessions. The overall prevalence (lifetime) of this disorder is estimated around 2.5% (Hajkak and Simson, 2002). Obsessive compulsive disorder is a common mental disorder that is usually chronic, severe and disabling (Manstra etal, 2002; Eskogoeskok, 1999, quoted from Elbson et al., 2004). The severity and duration of the disorder is sometimes so high and makes patient’s power and performance quite low and has a crippling effect on patient personal and social life (American Psychiatric Association, 2000). People with obsessive-compulsive disorder often are single or have married in higher age and their fertility rate is less (Rachman, 1985, quoted Azklark, 2004). The rate of separation or divorce, marital and sexual dissatisfaction is more in obsessive-compulsive disorder than other anxiety disorders and depression (Rasmussen and Essen, 1992 quoted Clarke, 2004). In addition, these patients are at risk of secondary depression (Vaysin Rasmussen, 1992; Velnier et al., 1976 Azklark Inc., 2004). Obsessive-compulsive disorder in children and adults is a common disorder that, if untreated, will be chronic (Posner et al., 1994). One of effective treatments for obsessive-compulsive disorder is using a drug named Clomipramine. While having side effects, by increasing consumption, recovery rate reduces (Kerninggreenland, 2002). The best non-pharmacological treatment for obsessive-compulsive disorder, is behavioral therapy that is undesirable for most patients and result in the loss of patients (25%). It seems that neurofeedback should be considered as a new treatment for obsessive-compulsive disorder (Hammond, 2003). Neurofeedback is a learning strategy to improve the ability of the brain to produce specific brain waves. In treatment by using neurofeedback, EEG is used as a start to the work of therapy. So that at first brain wave pattern is determined in disorder and then the amount of wave deviation from the normal pattern is determined. This work is done by electro anencephaly and graphics. Then by using Neurofeedback in order to restore waves to normal condition, patients are learned to control their brain waves and as a result, the sickness is treated. The use of this treatment has been proved for treating disorders like hyperactivity, attention deficit, epilepsy, anxiety and depression as well as obsessive-compulsive disorder (Hammond, 2005). The goal of neurofeedback treatment is sustainable normalization, without continuous dependency to behavioral therapy or medication. This treatment, in contrast to drug treatment, electrical seizures and magnetic stimulation is noninvasive and has mild side effects (Hammond, 2005). Since no similar study has been done in Iran regarding the application of neurofeedback treatment to reduce the syndromes of obsessive-compulsive disorder in order to reduce the psychological suffering of patients and prevention of sociological and psychological consequences of this disorder, the importance of this study is more evident. Therefore, while current study can create a background for technical literature related to therapeutic interventions in the field of obsessive compulsive disorder, it can provide usage filed of this treatment method. In this study, the use of electro anencephaly and graphics theoretically leads to a better understanding of the etiology of obsessive-compulsive disorder and practically leads to a more precise diagnosis of this disorder.

Hypothesis:
1. Neurofeedback therapy like the drug treatment, reduces the syndromes of obsessive-compulsive disorder.
2. Neurofeedback therapy reduces the syndromes of obsessive-compulsive disorder.
3. Drug treatment (selective serotonin reuptake inhibitors) reduces the symptoms of obsessive-compulsive disorder.
5. Neurofeedback therapy reduces symptoms of obsessions.

**Literature Review:**

**Conceptual definition of obsessive-compulsive disorder**

Obsessive-compulsive disorder is characterized by obsessions or practical obsessions which has caused distress and often interfere everyday functioning. Defining characteristics of obsessive-compulsive disorder, according to the DSM-IV-TR (2000) are obsessions, thoughts, images or impulses that seems meaningless to patient (American Psychiatric Association, 2000).

**Operational definition of obsessive-compulsive disorder**

In this study, this disorder based on clinical interview checklist and according to the criteria of DSM-IV, is diagnosed by a psychiatrist or clinical psychologist and impairment is measured on the basis of Padua inventory.

**Conceptual definition of Neurofeedback**

As definition of Vernon, ferric and Rubin (2002), Neurofeedback is a complex form of biofeedback that is based on certain aspects of cortical activity. Neurofeedback refers to an operant conditioning paradigm in which patient learns to reform the amplitude, frequency or integration of the brain electrophysiological aspects.

**Operational definition of Neurofeedback**

For Neurofeedback training, variety of devices and software is sent into the market. In the present study, Procomp Infiniti software from the company of Thought Technology in Canada is used.

**Conceptual definition of Electro anencephaly and graphics**

Electro anencephaly and graphics, is digitized recording of EEG. This type of EEG helps us to carefully evaluate the amplitude and frequency of the waves.

**Operational definition of Electro anencephaly and graphics**

Electro anencephaly and graphics is an EEG machine that acts digitally. In this type of EEG, instead of the traditional recording by the pen on special paper, the recording is done by using the computer and data are analyzed by special software and numerically are available. Finally, compared with normal subjects, the individual waves is studied.

**Conceptual definition of medicine**

The drugs are substances that are used for treatment and prevention of diseases.

**Operational definition of drug**

In this study, the drugs are selective serotonin reuptake inhibitors which are prescribed by a psychiatrist to cure the disease. The amount of drug dose depends on the severity of the disorder and psychiatric diagnosis. For each patient, sertraline starts at a dose of 50 mg and over 10 weeks reaches to 200 mg.
Obsessive-compulsive disorder and family
Family member that live with severe obsessive-compulsive disorder are stressful. Family members may directly spread the disease by trying to stop symptoms and by co-obligation. Family and community members extensively adapt themselves with patient’s practical obsessions so that stress and poor family functioning increases. (Kalvakorsy Azklark Inc. et al 1993, 2004).

The family critics may have a negative impact on the intensity of syndromes and effect on the level of depression and anxiety in the family members, how to respond them and thoughts and actions of patients with obsession (Amir, freshman and Foa, 2001). Obviously family members are caught in a difficult dilemma. They ignore patient’s obsession or compromise with it and the bad feeling caused by effects of the disease are terminated in this way.

Obsessive-compulsive disorder has a negative effect on person’s ability in social and occupational functioning (Clarke, 2004).

Clinical characteristics:
Common characteristic of obsession and compulsion is as below:
Thoughts or impulses force permanently to the patient’s self-conscious field.
The feeling of fear mixed with anxiety, is accompanied by manifestation and repeatedly forces individual to do neutralizing actions against that preliminary thought or impulse. Obsessions or compulsion (force) is alien to the ego, that person finds it strange to the feeling that has from himself as a psychological being. A person with Obsessive - Compulsive usually feels strong desire in him to resist them. However, about half of these patients showed little resistance against coercion. About 80% of all patients believe that coercion is unwise. Sometimes obsession-compulsion is important to patients. For example, even if patient loses his job because of the time he spends for washing, hence his belief is that his compulsive washing is morally correct (Sadok and Sadok, 2003).

Co-morbidity
Clinical disorders rarely occur in isolation. Like other anxiety disorders, obsessive-compulsive disorder has a high rate of diagnosis co-morbidity. Although in all studies, there is some differences but the most consistent findings is that half or one-third of people with obsessive-compulsive disorder have at least one additional disorder (Anthony et al., 1998; Stewart et al., 2003; Rice et al., 1993). When lifelong co-morbidity is considered, there is less than 15% of net diagnosis cases of obsessive-compulsive disorder (Rosyter, 2005)

Differential diagnosis
By mandatory personal suffering and impaired functions that is indicated in DSM-IV-IR for diagnosing the disorder, it’s differentiating from every day or extreme thoughts and habits will be possible. Major neurological disorders that should be considered in the differential diagnosis of obsessive-compulsive disorder is a Tourette disorder, other jump disorders (tick), Temporal lobe seizures and sometimes head injury and post-encephalitis complications.

Tourette disorder
Characteristic symptoms of Tourette disorder is jump (tick) in movement and sound producing muscles and that occurs repeatedly and almost every day. Tourette disorder and obsessive-compulsive disorder begins in the same age and have similar signs. About 90% of patients with
Tourette disorder have compulsive symptoms and many of them that are around two-thirds have diagnostic criteria for obsessive-compulsive disorder.

**Other psychiatric disorders**

Major psychiatric disorders that are considered in differential diagnosis of obsessive-compulsive disorder include schizophrenia, obsessive-compulsive personality disorder, various phobias and depressive disorders. Obsessive-compulsive disorder can be differentiated from schizophrenia, usually based on lack of other signs of schizophrenia, less quiriness on the nature of the symptoms and the patient's vision about his disorder. In obsessive-compulsive personality disorder, functions of individual will not be disturbed as much as obsessive-compulsive disorder. Phobia is distinguished based on the lack of relationship between obsessive thoughts and compulsive actions (that are usually mandatory avoidance). Major depressive disorder is sometimes accompanied with obsessive thoughts, but patients that just have obsessive-compulsive disorder cannot meet the diagnostic criteria for major depressive disorder (Sadikvvsadikv, 2003). Psychiatric diseases that have common clinical characteristics with obsessive-compulsive disorder are called spectrum disorder of obsessive-compulsive disorder (OCSDs) which include hypochondria, body deformation disorder, impulse control disorder, paraphilia and motility disorders such as tics and Tourette's syndrome (Goldsmith et al., 1998). In all cases these disorders, patient has repetitive thoughts (e.g. worry about the body) or repetitive behavior (such as theft).

**The relationship between syndromes of obsessive-compulsive disorders with other disorders**

Hasler et.al (2007) in a study evaluated the relationship between the symptoms of obsessive-compulsive disorder with a variety of disorders. Using factor analysis and cluster analysis, they searched the relationship between symptoms of obsessive-compulsive disorder and psychiatric conditions. Among all 317 participating patients with obsessive-compulsive disorder, systematic diagnostic interview using the Structured Clinical Interview based on DSM-IV was operated. Obsessive Compulsive Disorder syndromes were assessed by Yale-Brown scale. Based on cluster analysis, symptom dimensions in obsessive-compulsive disorder showed special relationship with comorbid psychiatric disorders that is indicated as follows:

- Factor I (sexual, religious, aggression thoughts, and forced to checking) greatly has relationship with co-morbidity of anxiety and depression disorders.
- Factor II (thoughts of symmetry and accuracy obsessions, repeatability and counting and compulsion to have order and discipline) is associated with bipolar disorders and panic disorder and Agora phobia.
- Factor III (pollution obsessions thoughts and compulsion to be clean) is associated with eating disorders.
- Factors I and II, are related to the early start of obsessive-compulsive disorder.

**Etiology**

Media neuropsychology biological agents, serotonergic systems and many clinical examinations that is performed on many kinds of drugs confirms the hypothesis that a kind of wrong regulation of serotonin effects on obsessive and compulsive symptoms in this disorder. The data suggest that serotonergic drugs are more effective than drugs that affect other neurotransmitter devices. However, it is not yet clear whether serotonin, as a cause of obsessive-compulsive disorder has
any role or not. In clinical studies about concentrations of serotonin metabolites (e.g. 5 Hydroxyl acid [5-HIAA]) in the cerebrospinal fluid, local interest of platelet connection to imipramine with hydrogen-3 (which binds to serotonin reuptake local) and the number of these connection local is measured and various findings about these values in patients with obsessive-compulsive disorder has been reported. In one study, concentrations of 5-HIAA in the cerebrospinal fluid was reduced after treatment with clomipramine and this has led to increased interest in the serotonergic system (Sadok and Ssadok, 2003).

**Noradrenergic system**

At present, little evidence about the noradrenergic system dysfunction in obsessive-compulsive disorder is available. Case reports have shown some degree of symptoms improvement of obsessive-compulsive disorder with oral administration of the Clonidine. Clonidine reduces the amount of released norepinephrine from presynaptic nerve terminals (ibid.).

**Neuro Immunology**

Streptococcal infections in childhood in some cases, plays a role in the obsessive-compulsive disorder. Streptococcal antibodies are involved in autoimmunity processes. If this is true that obsessive-compulsive disorder is caused by bacteria, so we hope that the antibodies will be used to treat this disorder (Miller, 2006).

Moore (2003) has shown that obsessive-compulsive disorder and tic is created in some children with immune response to Streptococcal bacteria. A- Beta-hemolytic Group Streptococcal infections can cause rheumatic fever. Approximately 10 to 30 percent of these patients suffer from Sydenham Chorea and show obsessive-compulsive symptoms (Sadok and Ssadok, 2003).

**Brain imaging studies**

Neuroimaging studies showed that people with obsessive-compulsive disorder, have different brain activity (Tanen, 2005). Previous studies by using neuroimaging methods in patients with obsessive-compulsive disorder have shown convergent results and all indicate changing of circuit operation and the neurological relations of the medial orbital frontal cortex (OFC), caudate nucleus and the thalamus. Tomographic Studies with Positron emission tomography (PET) in the case of obsessive-compulsive disorder reports increasing blood flow and metabolism in the middle frontal and anterior cingulate, right forehead and orbital frontal cortex in-between areas (Nordahl et al. 1989; Saul et al., 1991; Saxena et al, 1998; Pesintini and Bergman, 2000).

**Genetics**

Although obsessive-compulsive disorder has familial aspects (Lobar, 2003) but the contribution of genetics and environment is not be fully identified in creating this disorder (Alonso et al., 2004). In fact, results about family studies show that obsessive-compulsive disorder is genetically heterogeneous (Carnot et al, 1988). Alonso et al (2004) found that socio-cultural variables such as parenting style in interacting with genetic and biological factors play a role in the pathogenesis of obsessive-compulsive disorder phenotype.

**Other biological data**

According to electrophysiological studies, efforts made by the electroencephalograph (EEG), sleep and neurological- hormonal studies, the obtained data shows that there are some similarities between depression disorder and obsessive-compulsive disorder. The amount of non-specific abnormalities in EEG of patients with obsessive-compulsive disorder is more than usual.
The survey about sleep EEG shows that abnormalities such as shorter periods of rapid eye movement (REM) - latencies that is seen in depression disorders, exists in this disorder too. In neuroendocrine studies there have been found some similarities with depressive disorders including non-suppression in Dexamethasone suppression test in one third of these patients and suppression of growth hormone in response to administration of clonidine (John Miles et al., 2008).

**Behavioral factors**
Adherents of the theory of learning, know obsession as a conditioned stimulus. In their opinion, if a relatively neutrally stimulus through the accountable conditioning process is accompanied by inherently harmful or stressful events, will be associated with fear or anxiety and evokes these moods. In this way, an object or thought that has previously been neutral becomes a conditioned stimulus which can produce anxiety or discomfort. But the consolidation of compulsion (force) is done in another way. One discovers that some acts relieve anxiety and obsessive thoughts. In this way active avoidance strategies that have any form of coercion or ritual treatment are found to restrain anxiety and since avoidance strategies concerning the reduction of painful secondary drive, which is the anxiety, are effective, they are gradually stabilized, so compulsive behaviors are formed as a learned patterns in person. To explain some aspects of obsessive-compulsive phenomena (such as stressful thoughts that are not necessarily and inherently frightening and the way of compulsive behaviors stabilization and formation) more useful concepts can be gained from learning theory (Hammond, 2003).

**Psychological factors**
Freud in the early 1910s, attributed the reason of the behavior of obsessive-compulsive disorder to unconscious conflicts and in his initial conceptualization named it Obsessive neurosis, that we now call it obsessive-compulsive disorder. He posited that when faced with the demands of the Oedipus that trigger anxiety, a retreat of Defense happens. According to Freud, patients with obsessive-compulsive neurosis, regress to the anal stage of psychosexual development. Patients with obsessive-compulsive disorder when face with situations like retaliation or affection objects loss of one of the most important people in their lives and feel the risk of anxiety, fall back from this stage and come back to anal stage and this stage is emotionally accompanied by a very severe hesitation. This hesitation is the result of a split that occurs in drive fine unity that is characteristic of the oedipal stage that is the sexual and aggressive drive. The simultaneous existence of hate and love to a single individual, makes the patient infirm and disabled and with doubts and indecisiveness (Sadok and Sadok, 2003).

**Treatment:**
Obsessive-compulsive disorder is common in children and adults that, if untreated, will be chronic (Tennessee, 1999). Treatment for obsessive-compulsive disorder is unpredictable. Many patients give little response to treatment. The current standard treatment is medication and behavior therapy (Rubin et al., 2002).

**Pharmacotherapy**
The effectiveness of drug treatment for obsessive-compulsive disorder has been proved in several clinical trials. All drugs that are used to treat depression or other mental disorders, can be used in the treatment of obsessive-compulsive disorder according to their usual dose (Tennessee, 1999).
Selective serotonin reuptake inhibitors
Food and Drug Administration's (FDA) has confirmed all selective serotonin reuptake inhibitor available in the United States like Fluoxetine, fluvoxamine, paroxetine and sertraline for the treatment of obsessive-compulsive disorder. Although serotonin reuptake inhibitors have fewer side effects than other tricyclic anti-depressant, some people may experience complications such as sleep disturbances, nausea, diarrhea, headache, anxiety and restlessness after starting the treatment, but these are often transient. About 15 to 20 percent of patients that use selective serotonin reuptake inhibitors are suffer from insomnia disorder. Another complication of these drugs is malfunctioning (John and Williams, 2008).

Clomipramine
Among all of tricyclic and four cyclic drugs, the most selective one according to its effect on serotonin reuptake compared to norepinephrine reuptake is clomipramine and in this regard, just selective serotonin reuptake inhibitors overcomes it. Clomipramine power is just less than sertraline and paroxetine power based on their effect on serotonin reuptake. Clomipramine was the first drug that Food and Drug Administration approved for treating obsessive-compulsive disorder. Its value must be raised within 2 to 3 weeks in order to avoid gastrointestinal complications and drop in blood pressure (Sadok and Ssadok, 2003). This drug, such as other tricyclic ones has significant anti-cholinergic and lethargy effects such as mouth dryness, blurred vision, constipation, sweating, dizziness and delayed ejaculation (Hammond, 2003). In another study (Pato et al. 1988, quoting Hammond, 2003) it was found that in 89% of patients that were treated with clomipramine (brand name: Anafranil), disease recur after discontinuing the medication. In a recent study, Akram Newgreenland (2002) by studying 25 drugs found that the most effective medical treatment for obsessive-compulsive disorder (clomipramine) in Yale-Brown scale has average therapeutic effect of 64/10 (with improvement standard deviation of 33/1), respectively. However, in studies about Fluoxetine, therapeutic effect with the same scale was 4.5. They further stated that the more clomipramine usage continues, the less the healing effects of clomipramine are. Older patients have less improvement by using clomipramine. These findings are similar to results from Ackerman and colleagues (1996) and Abramatiz (1997) (Hammond, 2003).

Other drugs
If clomipramine therapy with one of selective serotonin reuptake inhibitor doesn’t offer any result, many therapists reinforce the medicine by adding lithium, valproate or carbamazepine. Other medicines that can be tried in the treatment of obsessive-compulsive disorder are venlafaxine, pindolol and monoamine oxidase inhibitors especially phenelzine. Other medications for the treatment of non-responsive patients is the Buspirone, 5-hydroxytryptamine (5-HT), L-tryptophan, and clonazepam (Sadok and Sadok, 2003).

Psychotherapy
Although the role of psychotherapy in obsessive-compulsive disorder is limited but the most modern interventions such as behavioral therapy and cognitive therapy showed promising results. Behavioral therapy is effective as medication in the treatment of obsessive-compulsive disorder (Vernon, 2003) and even, according to some studies, beneficial effects of behavioral therapy is more lasting. In cognitive-behavioral therapy, exposure and response prevention is an essential component of therapy. Repeated studies have shown that during therapy by exposure
and response prevention, 25% loss takes place and among those that complete the treatment (76 percent), around 50 to 80 percent reduction in symptoms occurs (Loysomarkz, 2002). Desensitization, thought stopping, flooding, explosion and implosive therapy and aversive conditioning, are among treatment that these patients have used. In behavioral treatment, real commitment of patient to treatment is necessary (Sadoo and Sadok, 2003). Foa and Franklin (2001) found that 76 to 86 percent of patients with obsessive-compulsive disorder that completed the course of behavioral therapy (exposure and response prevention) were treated. (John and Williams, 2008) reported that in more than 200 patients with obsessive-compulsive disorder, in 51%, symptoms decreased for at least 70 percent.

**Mental surgery**

For some obsessive-compulsive disorder patients, neither drugs nor psychological treatments are useful in relieving the symptoms of obsessive-compulsive disorder. These patients may choose mental surgery as a salvation. In this procedure, surgery is done in an area of the brain called the cingulate. Barlow et al (2006) in a study found that 30% of participants with a diagnosis of obsessive-compulsive disorder significantly benefited from this method. The most common complication of mental surgery is seizures that almost in all cases can be treated by phenytoin. Dougherty et al (2002) found that mental surgery is useful for only one third to one fourth of patients and most patients continue medical treatment after cingulotomy. Rach (2000, p 0.169) stated: “Overall efficiency of mental surgery for obsessive-compulsive disorder is very low, its cost is very high and it has a lot of risks. ".

**Other treatments**

Family therapy is often used to support families and help them in order not to experience marital discord as a result of this disorder. Establishing therapeutic alliance with the patient and his family members is useful. Group therapy for some patients may be useful as a support system.

Using Electric shock therapy (ECT) should be considered for highly resistant patients to treatment who have chronic disability. Electric shock is not as effective as the psyche surgery but it should be tried before surgery (Sadok and Sadok, 2003). Evidence has shown that regular treatment of nicotine can be beneficial in improving symptoms of obsessive-compulsive disorder, although pharmacodynamics mechanism of this improvement is still unknown and many complete studies are needed to confirm this hypothesis. Some reports shows that smoking worsens obsessive-compulsive disorder (Landberg et al., 2004)

**Neurofeedback:**

Advances in technology has made it possible to innovate in the psychological work. One of these cases is Neurofeedback that in which, people learn to change their pattern of brain waves by operant conditioning (Mastrepesk and Vahily, 2003). Neurofeedback is a complex form of biofeedback that is based on certain aspects of cortical activity and in which, Patient learns to reform the scope, frequency or integration of electrophysiological aspects of his brain. Neurofeedback is a special area in biofeedback that is used for control training on electrochemical processes in human’s brain (Evans and Barbanal and Lavako, 2003). Neurofeedback uses EEG feedback to show current electrical patterns of educator in his stratum. For this purpose, EEG recorded data can be sent to patient as feedback in different forms such as auditory, visual, or audio-visual mix. Many medical and neurological disorders are accompanied with abnormal patterns of electrical brain activity and to identify these patterns, basic EEG or
electro anencephaly and graphics can be used (Lavako, 2003). Clinical education by biofeedback EEG enables patient to change these patterns and make normal brain activity (EEG clinical, 2000). Neurofeedback is technology response to psychotherapy, cognitive rehabilitation and poor cortex function and is a wide educational system that increases growth and changes at the brain cellular level (demos, 2004). In this way some electrodes are attached to the head and ears, then the person sits in front of the monitor and a plays a game. He doesn’t use his hand in the game but his brain wave pattern moves the game. Neurofeedback analogy with the mirror can be helpful in describing the process of its effectiveness. When the face of a person is injured, he sees the wound in the mirror, understands the extend and depth of the wound and bandages it. In Neurofeedback, person also sees his abnormal brain waves and tries to resolve it. Research shows that Neurofeedback is an effective method to treat various disorders including obsessive-compulsive disorder, anxiety, epilepsy, attention deficit and hyperactivity disorder (Hammond, 2005).

**Research conducted in the field of Neurofeedback:**
Lobar (1995) stated that “long-term benefit of Neurofeedback training is the result of a learning process that guarantees acquisition of self-regulation skills through operant conditioning.” Lobar (1995) concluded that Neurofeedback treatment benefits are stable, but this requires further research. Dufy (2000) stated that "the literature review shows that Neurofeedback should have a major psychotherapy role in particularly difficult areas. If a way shows such a wide range of efficiency, it should be universally accepted and widely used.” However, numerous studies show that biofeedback EEG is effective in changing brain performance and creating important improvements in clinical syndromes in many fields such as epilepsy, attention deficit disorder and hyperactivity, learning disorders and head injuries (Hammond, 2006).

**Conclusion:**
There is no point of agreement and consensus to accept that changes of a treatment method is clinically meaningful or important. High percentage of improved patients, removed existing problems, created normal function after treatment, and the changes that the people experience in the life of the patient shows that Neurofeedback therapy is an effective method. Interviews with family members indicated that tangible changes have been created in their everyday life too. It can be concluded from these findings that Neurofeedback training method is effective in treating obsessive-compulsive disorder.
Overall, the results of the present study confirmed the first hypothesis that stated that "Neurofeedback treatment as well as medication reduces symptoms of obsessive-compulsive disorder "and also the second hypothesis (Neurofeedback treatment reduces symptoms of obsessive-compulsive disorder) and third (drug treatment reduces symptoms of obsessive-compulsive disorder) and fourth hypothesis (Neurofeedback treatment reduces practical OCD symptoms) and fifth hypothesis (Neurofeedback treatment is to reduce symptoms of OCD)
References