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Clinical Factors as Predictors of Neuropsychological Dysfunctions in Obsessive Compulsive Disorder

Abhilasha Dwivedi[1], Manoj Kumar Bajaj[2] and Priti Arun[3]

ABSTRACT

The aim of the study was to determine the clinical factors such as medication, duration, compliance, severity of illness, co-morbidity, onset, insight, family history, subtypes of OCD predictors of neuropsychological dysfunctions in persons with obsessive compulsive disorder. **Material and Methods:** An exploratory, single group and cross-sectional design was employed. Participants were selected consecutively from the outpatient department of psychiatry of a tertiary care government hospital from north region of India. Total 32 participants diagnosed as OCD as per WHO ICD-10 DCR criteria, educated minimum 10th class, of any gender, between age of onset 15 years to 55 years with minimum illness duration of 3 months were recruited. Participants those who have co-morbidity of any other psychiatric, neurological and physical/ medical illness, history of long term cognitive retraining were excluded except mental and behavioural disorder due to use of tobacco, and secondary depression due to OCD. A brief face to face interview was conducted to record the clinical profile of OCD like name of medication, doses of medicine, time, response to treatment, duration of illness,, onset, subtype of OCD, co-morbidity, course, severity of illness (OCD), level of depression, insight and family history of psychiatry illness or other. Further, Yale – Brown Obsessive Compulsive Scale (Y – BOCS) and Symptom Checklist; Hamilton Rating Scale for Depression (HAM–D); Medication Compliance Scale; Medication Adherence Rating Scale (MARS); Clinician Rating Scale (CRS). Subtests of Mental speed, Attention, Memory, Executive functions from NIMHANS Neuropsychological Battery for Adults-2004 were administered. **Results:** Severity of depression and onset of illness were significant predictors of mental speed. Insight was significant predictor of sustained, focused attention and set shifting. Co-morbidity was also significant predictor for set shifting. Medicine type was significant predictor for verbal fluency. Severity of illness, family history and response of treatment were significant predictor of working memory. **Conclusions:** Clinical Factors plays an important role in the development or maintenance of the neuropsychological dysfunctions in OCD, therefore management of OCD requires understanding for the clinical factors contributing to Neuropsychological dysfunctions, so that these can be prevented or managed simultaneously with cognitive retraining.

Key Words: *Obsessive Compulsive disorder, Clinical Factors, Neuropsychological Dysfunctions, Predictors*

INTRODUCTION

With a lifetime prevalence of between 2 and 3% in the general population, obsessive-compulsive disorder (OCD), which consists of obsessions and compulsions, is the fourth most prevalent psychological disorder. Patients with OCD experience frequent anxiety attacks and disability as a result of their repetitive thoughts and actions (Rauda et al., 2010). OCD symptoms are often associated with marked impairment of neuropsychological function. Depressive symptoms and Disorder are common clinical features of OCD (Catapano et al., 2001), which affects the neuropsychological functioning in OCD. Several studies examined the effects of clinical factors on neuropsychological impairments in OCD patients. Individual with OCD have been found to feel difficulties in inhibiting tasks of motor and cognition, attention shifting, executive functioning and memory. Inconsiistent neuropsychological dysfunctions may be due to the socio demographic and clinical factors and the available data is conflicting (Shin et al., 2014). The recent neuropsychological studies of OCD have found a close relationship between neuropsychological functions, Clinical factors and brain functions. Neuroimaging studies using PET, SPECT or fMRI have identified abnormally in the brain (Nakao et al., 2014).

Findings suggest that attention processes might be differentially impaired in sub-types of OCD with relevance to the age at onset (Hashimoto et al., 2011, Overbeek, et al., 2002).

Executive function performance difficulties seen in patients with OCD in other cognitive domains ((Nelson et al., 1993; Abbruzzese et al., 1995; Veale et al., 1996). Deficits in visual constructional area (Irle et al., 1990; Lawrence et al., 2000) and correlation between OCD and spatial working memory dysfunction have been found (Hashimoto et al., 2011). Memory for

[1] M. Phil Clinical Psychologist
[2] Associate Professor Clinical Psychology, Government Medical College and Hospital, Chandigarh Email mkbajaj@gmail.com
[3] Professor and Head, Department of Psychiatry, Government Medical College and Hospital, Chandigarh

actions is better reported by the OCD patients in a Meta analysis by Woods et al., (2002) demonstrated memory deficit in recall but not in recognition of verbal materials. Recall is impaired on complex figure test of visual memory (Lezak et al., 2004).

It is evident from the review of literature that neuropsychological dysfunctions exists in obsessive compulsive disorder in attention, verbal fluency and category fluency, visual memory and working memory, set shifting, response inhibition, and verbal and learning memory. In, many of the studies, relationship between neuropsychological functions and clinical factors such as medication and other clinical variables had significantly affected the cognitive functioning in individuals with OCD, whereas in several other studies the relationship between clinical factors and cognitive functions has not been significantly related. So, present investigation is an attempt to confirm the impact of clinical factors on neuropsychological functioning in persons with OCD. The impact of clinical factors on neuropsychological functioning in OCD patients is being less studied in India. There are no consistent findings that clinical factors influence the neuropsychological functioning in OCD; therefore it needs to be further clarifying and confirm the contribution of various clinical factors can predict in the progression and development of neuropsychological dysfunctions.

The aim of the study was to determine the clinical factors such as medication, duration, compliance, severity of illness, co-morbidity, onset, insight, family history, subtypes of OCD predictors of neuropsychological dysfunctions in persons with obsessive compulsive disorder.

Material and Methods: An exploratory, single group and cross-sectional design was employed. Participants were selected consecutively from the outpatient department of psychiatry of a tertiary care government hospital from north region of India. Total 32 participants diagnosed as OCD as per WHO ICD-10 DCR criteria, educated minimum 10^{th} class, of any gender, between age of onset 15 years to 55 years with minimum illness duration of 3 months. Participants those who have co-morbidity of any other psychiatric, neurological and physical/ medical illness, history of long term cognitive retraining were excluded except mental and behavioural disorder due to use of tobacco, and secondary depression due to OCD.

The recruited participants were interviewed for the socio-demographics & clinical details on specifically developed socio demographic and Clinical Performa sheet. A semi structured Performa developed for the purpose of present study. It contains information about socio – demographic variable like age, sex, education, occupation, marital status, address & contact, total monthly income and social class. A brief face to face interview was conducted to record the clinical profile of OCD like name of medication, doses of medicine, time, response to treatment, duration of illness,, onset, subtype of OCD, co-morbidity, course, severity of illness (OCD), level of depression, insight and family history of psychiatry illness or other. Further, Yale – Brown Obsessive Compulsive Scale (Y – BOCS) and Symptom Checklist; Hamilton Rating Scale for Depression (HAM – D); Medication Compliance Scale; Medication Adherence Rating Scale (MARS); Clinician Rating Scale (CRS); Subtests of NIMHANS Neuropsychological Battery: Mental Speed by Digit symbol Substitution test (DSST); Attention by Color Trails Test (D' Elia, 1996); Digit Vigilance Test (DVT) (Lezak, 1995). Verbal Fluency by Controlled Oral World Association Test (COWA) (Benton & Hamsher, 1989), Category Fluency by Animal Names test (Lezak,1995). Executive Functioning was assessed using N- Back test (Smith & Jonides, 1999), Wisconsin Card Sorting Tests (Milner, 1963) and Stroop test, (Alexander, Benson & Struss, 1989). Memory: Rey's Auditory Verbal Learning test (Schmidt, 1996), Rey Complex Figure Test (Lezak, 1995) were administered.

The participants in the present study were referred by psychiatry consultants with the primary diagnosis of OCD as per ICD 10 DCR criteria to the investigator. A total no. of 84 patients with OCD was referred by the expert psychiatrists in the OPD. Then the investigator interviewed the patient to screen the patient for the suitability of the present study on the basis of exclusion or inclusion criteria specified for the study. After screening and informed consent a total of 32 participants were recruited in the study. The rest 52 patient were excluded because of various reasons. The majority of patients (n = 15) were referred back as they were not fulfilling the inclusion and exclusion criteria. Twelve patients have not given consent, and 12 patients were having a history of co morbid psychiatric illness. Thirteen participants met the criteria of the present study but did not come on appointment hence considered as dropout of the study.

Finally (n = 32) patients comprised the sample of the study. Socio-demographic and clinical details were recorded with the help of socio-demographic and clinical datasheet. Thereafter tools were administered. No interference was done by the investigator in treatment and no advice was provided regarding the treatment. These cases were referred back to respective consultant after data collection. Data collected from the assessment was scored according to the standardized manual. The assessment procedure with each individual took about 3 to 4 hours. The obtained data was entered into SPSS for statistical analysis. Background

information was explained using descriptive statistics technique, frequency/ percentage for the participants with the help of Statistical Package for Social Science (SPSS) version 22. Pearson's correlation and regression analysis method used in the current study. Pearson correlation used for the knowing relationship between the clinical factors and neuropsychological functions of the participants. The linear regression analysis was computed to predict the actual contribution of specific clinical factors in Neuropsychological dysfunction in participants with OCD.

RESULTS

Table 1 Socio-demographic details of participant

Variable	Frequency (Percentage)
Gender	
Male	23(71.9%)
Female	9 (28.1%)
Education	
Matric	3(9.4%)
Inter / Diploma	6(18.8%)
Graduate	17(53.1%)
Postgraduate	6 (18.8%)
Marital Status	
Single	19 (59.4%)
Married	13 (40.6%)
Occupation	
Professional	1 (3.1%)
Clerical/ Shop- Owner/ Farmer	6 (18.8%)
Skilled / semi skilled	4 (12.5%)
Housewife	6 (18.8%)
Unemployed/ student	15 (46.9%)
Social Class	
Lower class	8 (25%)
Lower middle class	11 (34.4%)
Upper middle class	8 (25%)
Upper class	5 (15.6%)

Table 2 Clinical factors of persons with obsessive compulsive disorder

Variable	Frequency (Percentage)
Onset	
Within 3 months	10 (31.3%)
Stable on treatment for around 6 months	22 (68.8%)
Course	
Episodic	1 (3.1%)
Continuous	14 (43.8%)
Deteriorating	2 (6.3%)
Fluctuating	3 (9.4%)
Static	1 (3.1%)
Improving	9 (28.1%)
Remission	2 (6.3%)
Sub type of OCD	
Predominantly Obsession thoughts	15(46.9%)
Predominantly compulsive acts	9 (28.1%)
Mixed Obsession thoughts and acts	8 (25%)
Co morbidity	
OCD with depression	24 (75%)
OCD without depression	8 (25%)
Severity of illness	
Mild	11(34.4%)
Moderate	11(34.4%)
Severe	8 (25%)
Extreme	2 (6.2%)
Severity of depression	
Normal	7 (21.9%)
Mild depression	5 (15.6%)
Moderate depression	11(34.4%)
Severe depression	6 (18.8%)
Extreme	3 (9.4%)
Insight	
Good insight	12(37.5%)
Fair insight	20 (62.5%)
Family History	
Similar illness	7 (21.9%)
Other illness	3 (9.4%)
No	22 (68.8%)
Name of Medicine	
Fluoxetine plus Lonazep / Etirest / Etizolam	6 (18.8%)
Sertaline plus Olenzapine / Respridone	3 (9.4%)
Fluoxetine only	5 (15.6%)
Clofrnafil plus Paxidep	8 (25%)
Fluoxetine plus Clofrnail	4 (12.5%)
Dose of Medicine	
Fluoxetine plus Lonazep / Etirest / Etizolam	6 (18.8%)
Sertaline plus Olenzapine / Respridone	3 (9.4%)
Fluoxetine only	5 (15.6%)
Clofrnafil plus Paxidep	8 (25%)
Fluoxetine plus Clofrnail	4 (12.5%)
Response of treatment	
Good	7 (21.9%)

Average	17 (53.1%)
Poor	8 (25.1%)

Table 3 Clinical factors as predictors and neuropsychological functions of the OCD

Clinical factors as Predictors	Cognitive Functions	Beta value	Significant
Severity of depression	Mental Speed	.371	.024*
Onset	Sustained Attention	.440	.011*
Insight		-.397	.020*
Response of treatment		.345	.042*
Insight	Focused Attention	.394	.026*
Name of medicine	Verbal Fluency	.351	.049*
Severity of illness	Working Memory	.387	.010**
Family History		-.306	.038*
Response of treatment		-.534	.000**
Insight	Set Shifting	.383	.031*
Co morbidity		.373	.036*

Significance: * P < 0.05, ** P < 0.01

DISCUSSION

The present study was conducted with the aim to determine the clinical factors such as medication, duration, compliance, severity of illness, co-morbidity, onset, insight, family history, subtypes of OCD predictors of neuropsychological dysfunctions in persons with obsessive compulsive disorder. Measurement of neuropsychological functions provides an intermediate or middle path between clinical assessment and highly sophisticated functional imaging studies.

Description of the socio demographic details is presented in Table 1. Majority of the patient were male, single and belong to lower middle background population and all participants were educated. The clinical factors showed in table 2, majority of OCD patients onset of illness was stable on treatment around 6 months; course was continuous; predominantly obsession thoughts and co morbidity with depression. The maximum of OCD patient had fair insight and no family history. The severity of illness on Y – BOCS were mild. The more frequently medicine, i.e, Fluoxtenine used or without with other combination of anti-anxiety or antidepressants. Overall response to the treatment in patients was average.

Result table 3 depicting the significance of clinical factors in neuropsychological dysfunction of the OCD patient. Severity of depression and onset of illness were significant predictors of mental speed. Insight was significant predictor of sustained, focused attention and set shifting. Co-morbidity was also significant predictor for set shifting. Medicine type was significant predictor for verbal fluency. Severity of illness, family history and response of treatment were significant predictor of working memory.

The findings in this present study indicative of the significance of clinical factors in the development of neuropsychological dysfunctions in patients with OCD. Findings of this study are consistent with the findings of previous researches. Further, findings of current study are discussed in the following headings:

Onset

Onset of illness was classified into two categories to recruit the participants in the study to have the new onset patients one was within 3 months the other was stable on treatment for 6 months. Onset was significantly positively correlated with the scores of mental speed, sustained and focused attention, stroop effect and learning across trial 5. The findings revealed that onset of illness increases as well as impairment of mental speed and delayed information processing, difficulty to maintaining their attention on particular tasks for long period of time, easily distractible, unable to change of perceptual set from one stimulus to other stimulus as per environmental demands and inability to encoding of the new information also increases in OCD patients. The findings also revealed that Onset was also significant predictors in contribution of the neuropsychological dysfunction in OCD patients. These findings were similar to earlier researches. Christensen et al (1992) and Purcell et al (1998) mentioned that OCD patients slowest on motor initiation and speed tasks.

Course

Course of illness was classified into seven categories: episodic, continuous, deteriorating, fluctuating, static, improving and remission respectively. Course of illness are not significantly correlated with the other neuropsychological functions. The previous researches have not examined the relationship between course of the illness and neuropsychological functioning of the OCD patients.

Sub type of OCD

In the present study, sub type of OCD was classified into three categories: predominantly obsessional thoughts, predominantly compulsive acts and mixed obsessional thoughts and acts according to the classification of ICD – 10. There was no significantly relationship between the sub type of OCD and cognitive functioning. In contradictory, the previous studies were not classified the OCD according to ICD -10. They are taking the sample of OCD patients as per diagnosis of

DSM – IV TR. Hartston and Swerdlow et al, reported in their studies that OCD aggressions obsessions or checking had more greater interference effect.

Co morbidity

In the present study, co morbidity of OCD was classified into two categories: OCD with depression and OCD without depression. Co morbidity was statistically negatively correlated with the score of mental speed, sustained attention and failure to maintain set (set shifting) and statistically positively correlated with the score of no. of categories completed (set shifting). Finding are similar to that reported by Christensen et al. (1992) that slow motor performance and information processing in OCD patients who had co morbid depressive psychopathology.

Duration of illness

There was no significant relationship between duration of illness and neuropsychological functioning of the OCD patients in the present study. The previous researches were not examined the relationship between duration of the illness and neuropsychological functioning of the OCD patients.

Severity of illness

In the present study, severity of illness was assessed through Y – BOCS. Severity of illness was negatively correlated with category fluency (animal name test). Severity of illness was the significant predictor in cognitive dysfunction of the OCD. This finding was contradictory of earlier researches. Schmidtke et al.,(1998) reported in their studies that OCD patient were impaired on fluency test but impairment not related to severity of OCD symptoms.

Severity of depression

Severity of depression was assessed through Hamilton Depression rating scales. Severity of depression was statistically positively correlated with the score of mental speed and sustained attention. It is an important significant predictor in development and progression of neurocognitive dysfunction of the OCD patient. OCD patients continued to show significant impairments in mental speed and sustained attention. This finding are similar to that reported by Christensen et al who reported slow motor performance and information processing in OCD patients who had co morbid depressive psychopathology.

Insight

Insight was assessed through Y – BOCS on 11^{th} item. The majority of OCD patient had good or fair insight due to regular compliance of medicine and therapeutic interventions. There was significantly positively correlated insight among focused attention, no. of preservative responses and no. of categories completed in set shifting, and stroop effect. Insight is significant predictors in cognitive dysfunction. It indicates that the OCD patients had inability to organize the things and more interference effect.

Family History

In the present study, Family history was classified into three categories: similar illness; other psychiatric illness or no illness. Family history was negatively correlated with mental speed, and focused attention.

Name and dose of medicine

In the present study, Name and dose of medicine were positively correlated with the score of controlled oral word association test. Name of medicine were significant predictor in the dysfunction of verbal fluency.

Response of treatment

In the present study, response of treatment was negatively correlated with the score of sustained attention, and working memory. Response of treatment was significant predictor for the neuropsychological dysfunctions.

CONCLUSION

Overall findings of the study suggest that patient with OCD showed impairment in information processing, slow motor performance, easily distract by the external stimulus, inability to maintained and sustaining attention for a long period of time due to may be anxious state, inability to attending and encoding of the new information, cognitive inflexibility, inability to change the responses as per environmental stimulus and more interference effects on particular tasks. The findings of current study revealed that clinical factors, i.e., onset, severity of illness and severity of depression, co morbidity, insight, name of medicine and response of treatment were significant predictors in the development and progression of neuropsychological dysfunction in patient with OCD. The present study needs to be replicated with large sample size with control groups as the findings are very interesting and needs to be done longitudinally to further determine the impact of clinical factors in progression of the neuropsychological dysfunctions. Clinical factors plays an important role in the development or maintenance of the neuropsychological dysfunctions in OCD, therefore management of OCD requires understanding for the clinical factors contributing to Neuropsychological dysfunctions, so that these can be prevented or managed simultaneously with cognitive retraining.

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