© Journal of the Indian Academy of Applied Psychology
July 2013, Vol.39, No.2, 228-236.

Subjective Perception of Impulsivity in Patients with Obsessive – Compulsive Disorder

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The diagnostic heterogeneity, its nosological placement, and the notion of spectrum rather than the earlier position of specific types or traits to understand personality factors in obsessive compulsive disorders is gaining ground. There is some inconsistency regarding placement of impulsivity as 'low' pole or central axis in this spectrum, thereby, warranting further investigation. This hospital based two-group cross comparative study examines impulsivity in patients with obsessive compulsive disorder (N=30) against matched healthy controls (N=30). Using purposive sampling, target respondents were administered 'Barratt Impulsiveness Scale' and 'Cambridge Gambling Task'. Inferential statistical techniques used to compare the two groups and identify covariance between scores on the studied variables reveal that patients with obsessive compulsive disorder consistently score high on impulsivity in comparison to normal healthy controls. These findings are discussed with opposing findings before concluding on the need for deeper investigations in this area which has bearing on planning treatment regimes for reduction of impulsivity in patients suffering from such clinical conditions.

Keywords: Obsessive Compulsive Disorder, impulsiveness, decision-making, risk taking behaviour

Obsessive Compulsive Disorder (OCD) is the fourth most common psychiatric disorder (Pigott 1998) affecting approximately 2-3% of general population (Abramowitz, Brigidi & Roche, 2000) with equal prevalence in men, women, and children (March & Mulle, 1998). The behavioral features of obsessive compulsiveness and impulsivity, as distinct from its primary disorder, are seen in many psychiatric conditions (McElroy, Phillips & Keck, 1994). The failure to 'resist an urge, drive, or temptation to commit an act that is harmful to the individual or to others' is classified as 'Impulse Control Disorder' (DSM-IV-TR, 2000) or as 'Habit and Impulse Disorders' (ICD-10, 1992). It is reported that 29 % of patients with OCD have co-morbid features of other impulse control conditions (Matsunaga et al. 2005). With respect to symptoms, OCD has been characterized as a disorder of impulse control with some patients exhibiting conduct and anger-control difficulties (Stein, Hollander, Simeon & Cohen, 1994). Furthermore, following successful treatment of OCD symptoms, reductions in impulsivity and anger have been noted (Lopez-Ibor, 1990).

In personality literature, impulsivity has been conceptualized variedly (Cloninger, 1996). Most definitions have incorporated 'risk taking, instability, a lack of reflection and restraint, and proclivity to engage in behaviors associated with immediate gratification' as core features of impulsivity (Frost, Steketee, Cohn & Greiss, 1994). Impulsivity, as central feature of personality, has been invoked to understand and diagnose the psychopathology in OCD, mania, addictive disorders, or attention deficit-hyperactivity disorders. It has been characterized by 'underestimation of harm, non-reflective responses, difficult-to-control desires and repetitive behaviors to obtain pleasure and gratification' (Li & Chen, 2007). It is also defined as 'failure to evaluate a situation as risky, acting

without thinking and inability to plan ahead' (Helmers, 2000). Gray, Owen, Davis, and Tsaltas (1983) proposed that impulsive individuals are 'insensitive to stimuli associated with punishment, display excessive sensitivity to stimuli associated with reward and display a deficit in passive avoidance learning'. Impulsivity can be regarded as 'predisposition to action without reflection or regard for consequences' (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Consequences of impulsivity include substance abuse (Swann, Dougherty, Pazzaglia, Pham, & Moeller, 2004), suicidal behavior (Swann et al. 2005) and other serious behavioral problems (Stanford & Barratt, 1992).

Despite the growing acceptance for diagnostic heterogeneity, its nosological placement and the notion of spectrum (Oldham, Hollander & Skodol, 1996) rather than the earlier positions when specific types or traits were postulated to explain personality factors in OCD, there is disagreement regarding placement of impulsivity either as 'low' pole or central axis on this spectrum (Hollander & Wong, 1995), thereby, warranting further investigation. While some investigators highlight the phenomenological similarities between OCD and impulse control (Lopez-Ibor, 1990), some maintain a distinction between impulsive and non-impulsive groups of OCD (Hoehn-Saric & Barksdale, 1983). Zermatten & Linden (2008) explored the relationship between obsessive-compulsive symptoms and four facets of impulsivity (Urgency, Lack of Premeditation, Lack of Perseverance and Sensation Seeking) in 220 non-clinical individuals. Their results revealed a strong link between 'Urgency' and obsessive-compulsive symptoms. In addition, 'Lack of Premeditation' negatively predicted the 'Checking and Ordering' subscales, while 'Lack of Perseverance' was positively linked with 'Obsessions' and negatively with 'Ordering'. Finally, no relation was found between obsessive-compulsive symptoms and 'Sensation Seeking'. Even as there are studies which have found individuals with obsessive compulsive symptoms scoring low, high, or differently from non-clinical controls on measures of impulsivity (Frost et al. 1994), other studies on clinical samples have not found these differences to be statistically significant (Richter, Summerfeldt, Joffe, & Swinson, 1996). These disparities suggest a need for further explorations on questions like how much and to what extent, or whether there are any particular facets of impulsivity that can throw light on the intricate matters of relationship between impulsivity vis-à-vis OCDs. Therefore, it was the aim of this study to profile the nature-spread of impulsivity as well as explore linkages (if any) between the measured impulsivity as a trait and its overt expressions as observable-measurable impulsive behaviors in patients with OCD.

Method

A hospital based two-group cross comparative research design was envisaged for this study to examine impulsivity in patients with OCD as against matched healthy controls. The key variables of this study are 'subjective perception' and 'impulsivity'. The term 'subjective perception' as used in this study refers to 'an evaluation relating to or made on or about oneself' (Lang, 1991). The whole exercise of such perception is intended to elicit perspective for each individual, according to their own standpoint. The term 'impulsivity' generally refers to acts without any pre-meditated forethought and without realizing the risks involved in that behavior or without consideration of consequences (Barratt & Slaughter, 1998).

Sample:

Some 30 patients diagnosed as OCD based on the official criteria (ICD-10) belonging to both gender, aged between 18-50 years, educated at least till class 6 and having obtained a minimum total score of seven on a dedicated diagnostic tool for screening obsessive-compulsive symptoms, were recruited from Out-Patient Services in Central Institute of Psychiatry, under Ministry of Health and Family Welfare, Government of India, located at Ranchi, Jharkhand, between October 2008 to August 2009. Another 30 typical individuals matched for age, gender, and education was drawn from relatives as normal non-clinical controls. Individuals with significant medical, psychiatric,

and neurological disorders as associated conditions were excluded. A score of below three on General Health Questionnaire-12 (GHQ-12)(Goldberg, 1992) was used as criteria for segregation of non-clinical control group and the clinical or experimental groups in this study.

Tools:

The Barratt Impulsiveness Scale, Version-11 (BIS-11)(Patton, Stanford, & Barratt 1995): This 30-item self-report questionnaire was used as a measure of impulsiveness across six primary and three secondary factors. The primary factors are attention, motor, self-control, cognitive complexity, perseverance, and cognitive instability. The secondary factors are attention-cognitive instability, motor-perseverance and non-planning (self control-cognitive complexity). Respondents are required to rate each statement on this Likert-type scale of 1 (rarely/ never) to 4 (almost always/always). Scoring for each item is carried out according to the directional valence of their wording either in forward or reverse direction. The minimum-maximum score possible on this tool range between 30 and 120. High scores indicate increased impulsiveness. A total score => 75 indicate an impulse-control disorder, whereas a total score in the range of 70-75 indicate pathological impulsivity (Barratt, Lijffijt, & Moeller, 2005). A domain wise/factor wise score is also possible to be derived for individual respondents on this scale. The one month test-retest reliability, inter-correlations among its subscales and internal consistency range from 0.79 to 0.83 (Patton et al. 1995), concurrent validity with other self-report and behavioral measures of impulsiveness along with utility over the decades of its existence has been confirmed (Stanford et al. 2009).

Cambridge Gambling Task (CGT)(Rogers et al., 1999): Betting or gambling tasks paradigm has been often used for measuring decision-making and risk taking behavior. Briefly, in the gambling task, subjects have to choose between decks of cards which yield high immediate gains but larger future loss, i.e., long term loss, and decks which yield lower immediate gains but a smaller future loss, i.e., a long term gain. While the original format of this game involves use of playing cards, in the present study, performance of subjects on a computer based gambling task taken from Cambridge Neuropsychological Test Automated Battery (CANTAB) (Fray, Robbins, & Sahakian, 1997; Robbins et al. 1994) was used even though the battery includes a wider variety of cognitive tasks presented on a high resolution touch screen monitor under computer control (Cambridge Cognition, 2005).

The procedure involves use of a computer-aided touch-screen response to be completed in about 30 minutes. For each trial, a subject is presented an array of 10 boxes colored red and blue in varying ratios of red and blue boxes on the screen. The respondent is expected to make a probability judgment to guess which color hides a concealed token followed by a wager. The ratio of colored boxes vary in the ratios across 9:1, 8:2, 7:3 and 6:4 on a trial-to-trial basis in a randomized manner. Token location is pseudo-randomized and independent on each trial. Hence, on a 9:1 trial, the proportion for correct response is 90:10. The respondent indicates choices by touching a response panel labeled 'red' or 'blue' before being invited to place a bet based on the confidence in their decision in order to increase their point tally over trials. Possible bets are presented in ascending or descending sequence of 5, 25, 50, 75 and 95 per cent of the points held at the time of the decision. Each bet is presented for 5 seconds before being replaced by the next bet. The respondent must touch the bet that they think is appropriate. The respondents complete 36 trials with bets presented in ascending sequence and 36 trials in descending sequence which is counterbalanced for order of presentation across subjects. Any disparity in betting between ascending and descending conditions indicate response disinhibition. An impulsive respondent will expectedly react early and, therefore, place low bets in ascending condition and high bets in descending condition. A risk-taking subject, in contrast, would wait in the ascending condition to place a high bet. Following each betting, the respondents are provided feedback in the form of a verbal win or lose message, the position of yellow token is shown and the amount of bet is either added or subtracted to their score tally.

Dependent measures on the gambling task for this study were decision-making quality (the proportion of trials where the majority color was selected), decision-making latency (average response time to make the probability decision) and the average percentage bet. Bankruptcies (where subjects lost all points within a block) were also analyzed.

Yale-Brown Obsessive-Compulsive Scale (Y-BOCS)(Goodman et al. 1989a; 1989b): It was designed to remedy the problems of existing rating scales by providing a specific measure for the severity of symptoms of OCD that is not influenced by the type of obsessions or compulsions present. The scale is clinician rated and based on semi-structured interviews of affected patient and/or significant others. This scale measures the presence and severity of obsessive–compulsive symptoms within six distinct dimensions that combine thematically-related obsessions and compulsions. Although the tool has existed in several formats in truncated or extended versions, only items 1-10 are recommended for use to determine total score as carried out in this study. Each item rated based on symptom severity for the previous week from 0 (no symptoms) to 4 (extreme symptoms) (total range, 0 to 40), with separate subtotals for severity of obsessions and compulsions. The psychometric properties of this tool examined according to a multi-trait multi-method approach found acceptable internal consistency, excellent inter-rater reliability and 'lower than desirable' test retest reliability apart from good convergent validity with most other measures of OCD (Rosario-Campos et al. 2006).

General Health Questionnaire-12 (GHQ-12)(Goldberg, 1992): This tool was used in this study to screen and recruit subjects under non-clinical control group and as an indicator of their psychological wellbeing. As a self report instrument, this instrument is designed for detection and assessment of individuals with an increased likelihood of a current psychiatric disorder. The original questionnaire consists of 60 items from which shorter versions of 30, 28, 20, and 12 items were developed. Each subject is expected to complete the 12-item questionnaire by choosing for each item between four answer possibilities: 1-not at all, 2-no more than usual, 3-rather more than usual, 4-much more than usual. The higher the score, the poorer is the psychological well being of the patient. The psychometric properties of GHQ are severally established (Vieweg & Hedlund, 1983).

Procedure

Following informed consent, assurance on maintaining confidentiality and adherence to other ethical guidelines typically followed for bio-behavioral research studies relating to human subjects, data collection for this study involved the initial demarcation between clinical and control groups. The clinical group was rated on 'Yale-Brown Obsessive-Compulsive Scale' (Y-BOCS)(Goodman et al. 1989a; 1989b). Subjects in the control group were recruited based on cut off scores below three on 'General Health Questionnaire-12' (GHQ-12)(Goldberg, 1992). After formation of the two distinct groups, participants were assessed on 'The Barratt Impulsiveness Scale, Version-11' (BIS-11)(Patton et al. 1995) and subjected to the chosen 'Cambridge Gambling Task' (CGT)(Rogers et al., 1999) under 'Cambridge Neuropsychological Test Automated Battery' (CANTAB) (Cambridge Cognition, 2005; Fray et al. 1997; Robbins et al. 1994).

The dependent or outcome measures obtained in this study as data units for analysis between both the groups was individual overall and domain-wise scores on 'The Barratt Impulsiveness Scale, Version-11'. For the 'Cambridge Gambling Task', the derived data on decision-making quality of the subjects was in the form of decision-making quality (the proportion of trials where the majority color was selected), decision-making latency (average response time to make the probability decision) and the average percentage bet. Bankruptcies (where subjects lost all points within a block) were also analyzed.

The derived data was subjected to statistical analysis by means of independent sample t test and ÷2 to compare the two groups for significant differences. Pearson bivariate correlation was used to identify correlations between BIS-11 and CGT scores. Statistical significance was set at p

<0.05 and all tests were 2-tailed. Cronbach's alpha coefficient of internal consistency was also calculated.

Results

The ground exercise to match clinical-experimental (N: 30; Mean: 7.8; SD: 1.5) and non-clinical control group (N: 30; Mean: 0.40; SD: 0.67) based on critical cut off score of the GHQ-12 (table 1) reveals statistically significant differences (t: 23.9; df: 59; p<0.001).

Additionally, group comparisons between the clinical-experimental and non-clinical healthy control groups based on age (experimental group N: 30; Mean: 28; SD: 6.99 and control group N: 30; Mean: 26; SD: 3.08) and education (experimental group N: 30; Mean: 12.43; SD: 2.92 and control group N: 30; Mean: 12.73; SD: 2.80) variables as well as other socio-demographic variables like gender (χ2=0.00), occupation (χ2=0.66), marital status (χ2=1.07), SES (χ2=1.01), residence (c2=*1.07*) and religion (χ2=*1.22*) consistently revealed no statistically significant differences (p>0.05) thereby re-confirming the equivalence and homogeneity between the two groups bifurcated in the study.

Contrasting the above mentioned sketch of the non-clinical healthy control groups, the profile of the clinical group of OCD patients included in this study shows that they have clinical range of elevation of scores on Y-BOCS obsession score (N: 30; Mean: 12.93; SD: 2.28), Y-BOCS compulsion score (N: 30; Mean: 12.16; SD: 2.62) and Y-BOCS total score (N: 30; Mean: 25.10; SD: 4.53).

An analysis of the outcome variables of the study with respect to overall as well as the assessed primary (except one) and secondary factors for scores on BIS-11 (Table 2) shows statistically significant difference with consistently high impulsivity scores for clinical-experimental OCD group as against low impulsivity scores for the non-clinical healthy control groups (p <0.05).

Table 1. Group comparison between experimental and control groups on GHQ scores

Variables	Experimental N=30		Control N=30		t	df	P
	Mean	SD	Mean	SD			
GHQ	7.8	1.5	.40	.67	23.9	59	.001

*p<0.05

Table 2. Mean, SD and t-value of overall and sub domain scores on Barratt Impulsiveness Scale

Sub Domains	Groups				t-value
	OCD (N=30)		Control (N=30)		
	Mean	SD	Mean	SD	
Primary Factors:					
Attention	11.8	1.7	8.9	1.7	6.5*
Motor	15.3	2.4	14.2	3.0	1.5
Self-Control	14.3	2.7	11.6	3.7	3.1*
Cognitive Complexity	13.4	2.4	11.2	2.0	3.8*
Perseverance	7.9	1.5	6.9	1.7	2.4*
Cognitive Instability	7.4	1.4	5.3	1.8	4.7*
Secondary Factors:					
Attention-Cognitive Instability	19.2	2.5	14.3	2.5	7.5*
Motor Perseverance	23.2	3.1	21.1	3.4	2.5*
Non-planning	27.7	4.3	23.2	4.8	3.8*
Overall	140.5	13.1	116.6	16.3	6.2*

*p<0.05

These trends on impulsive tendencies of patients with OCD in this study are re-affirmed by their lower points earned on the ascending (N: 30; Mean: 532.3; SD: 392.6) as well as descending (N: 30; Mean: 481.5; SD: 892.6) series on the 'Gambling Tasks' compared to correspondingly higher points reaped by the non-clinical healthy control groups ($p<0.05$). The same tendency is shown even with respect to their speed or response latency on the task between the two groups which is also found to be statistically significant (Table 3).

An inter-correlation matrix delineated between domain wise impulsivity scores on BIS-11 and CGT (Table 4) for the clinical group of patients with OCD reveal a statistically significant positive correlation coefficient (r: 0.467; p: <0.05) only with respect to choice latency ascending on 'self control'. The Cronbach's alpha coefficient of internal consistency vary between 0.7 (acceptable) to 0.9 (excellent) ranges following the rules of thumb provided by George and Mallery (2003).

Table 3. Mean, SD and t-value of overall and sub domain scores on Barratt Impulsiveness Scale

Sub Domains	Groups				t-value
	OCD (N=30)		Control (N=30)		
	Mean	SD	Mean	SD	
Primary Factors:					
Attention	11.8	1.7	8.9	1.7	6.5*
Motor	15.3	2.4	14.2	3.0	1.5
Self-Control	14.3	2.7	11.6	3.7	3.1*
Cognitive Complexity	13.4	2.4	11.2	2.0	3.8*
Perseverance	7.9	1.5	6.9	1.7	2.4*
Cognitive Instability	7.4	1.4	5.3	1.8	4.7*
Secondary Factors:					
Attention-Cognitive Instability	19.2	2.5	14.3	2.5	7.5*
Motor Perseverance	23.2	3.1	21.1	3.4	2.5*
Non-planning	27.7	4.3	23.2	4.8	3.8*
Overall	140.5	13.1	116.6	16.3	6.2*

*p <0.05

Table 4. Inter-correlation Matrix of scores on sub-domains between Barratt Impulsiveness Scale and Cambridge Gambling Task in patients within OCD group (N=30)

Sub-domains	A	M	SC	CC	P	CI	AI	MP	N	BIS total	a
Total points earned in ascending series	.102	-.083	.271	-.009	.194	-.068	.028	.029	.165	.134	0.747
Total points earned in descending series	-.023	-.197	.148	.109	.105	-.003	-.017	-.105	.154	.046	
No. of blocks lost in ascending series	-.121	-.099	-.260	.148	-.072	.258	.071	-.114	-.080	-.079	-0.235
No. of blocks lost in descending series	-.016	.285	-.116	-.109	-.032	.068	.029	.211	-.133	.022	
Choice latency ascending	.245	.036	.467*	.116	.170	-.153	.073	.112	.356	.319	0.883
Choice latency descending	.138	-.171	.216	.214	-.032	-.084	.043	-.152	.254	.115	
Percentage bets in ascending series	-.133	-.120	-.246	-.081	-.016	-.046	-.116	-.103	-.198	-.226	0.965
Percentage bets in descending series	.014	-.113	-.226	.108	.087	.088	.061	-.047	-.106	-.069	

(A)Attention, (M) Motor, (SC) Self-Control, (CC) Cognitive Complexity, (P) Perseverance, (CI) Cognitive Instability, (AI) Attention-Cognitive Instability, (MI) Motor Perseverance, (NI) Non-planning. *p <0.05

Discussion

The results of this study indicate that patients with OCD have higher scores on 'attention-impulsiveness' factor in comparison with matched normal controls, which is indicative of their poor focus on the tasks at hand, as higher scores on the 'non-planning impulsiveness' factor is indicative of poorer planning and less enjoyment of challenging mental tasks (Patton et al.1995). Impulsivity in patients with OCD was consistently high as demonstrated by their high scores on BIS-11. These findings are supported by previous studies that have found patients with OCD having significant impulsivity (Hollander & Wong, 2000; McElroy, Pope, Keck & Hudson, 1995). Summerfeldt, Hood, Antony, Richter, and Swinson (2004) found similar results between three groups of patients with anxiety disorders (OCD, panic disorder and social phobia) differing from a non-clinical control group with regard to their self evaluated levels of impulsiveness as measured on BIS-11. Ettelt et al. (2007) also found significantly high scores on cognitive impulsiveness in OCD subjects compared with normal controls. In an investigation on obsessive-compulsive features and impulsivity in a non-clinical population of adolescent males and females, it was found that the domain on 'lack of perseverance and self control' and 'novelty seeking acting without thinking' under BIS-11 correlated negatively for females but not for males (Li & Chen, 2007).

It has been suggested that OCD subjects with elevated impulsivity are more likely than non-impulsive OCD controls to have more behavioral dysregulation, conduct disturbance in childhood, and a greater range of psychopathology in adulthood (Hoehn-Saric & Barksdale, 1983). An impulsive subject might be expected to have difficulty in withholding manual responses to the bets as they are presented during a gamble game situation. This is reflected by the subjects making early bets in both ascending and descending conditions. Thus, impulsivity is reflected by a pattern of low bets in ascending condition and high bets in descending condition (Rogers et al. 1999). This study also found similar results that both patients with OCD and normal controls have low percentage bets in ascending series and high percentage bets in descending series while patients with OCD and controls group have significant difference in total points earned in ascending series, total points earned in descending series and choice latency ascending.

In sum, the findings of this study are consistent with the hypothesis that there is higher impulsivity in patients with OCD than healthy controls and that choice latency (ascending) has significant positive correlation with self-control. This implies that if the subject does carefully plan, procrastinate, and reflect, s/he will have greater choice latency or time for deliberation. However, this aspect requires further research. The finding on higher impulsivity in patients with OCD need not necessarily implicate a possibly poor prognosis. It only reiterates that treatment regimes for OCD must incorporate impulsivity reduction strategies on a regular therapeutic basis.

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Received: January 29, 2013
Revised: March 27, 2013
Accepted: April 23, 2013

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