

A comparative study on obsessive compulsive symptoms in temporal lobe and generalized epilepsies

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Abstract

Background & Objective: Temporal lobe epilepsy has been associated with psychopathology especially obsessive-compulsive (OC) traits or symptoms as one of its specific personality characteristics as compared to other epilepsies. This study was undertaken to assess the prevalence and type of OC symptoms in patients with complex partial seizures (CPS) and generalized seizure disorders and the association of OC symptoms with right or left sided lesions in patients with CPS. **Methods:** Thirty patients each of CPS and generalized seizure disorder were enrolled to study OC symptoms with the help of the Padua Inventory, a 39 item measure of obsessions and compulsions on 5 content areas relevant to obsessive compulsive disorder. A proforma was prepared to study the various demographic variables, details of seizure disorder and MRI findings. **Results:** Ninety three per cent of CPS patients had OC symptoms as compared to 40% generalized seizure patients which was statistically significant. Dressing and grooming compulsions, contamination obsessions and washing compulsions were predominant in both the groups. On all the domains of the Padua Inventory, the CPS patients had statistically significant dysfunction than the generalized seizure patients. A highly significant association between left sided temporal lobe sclerosis for obsessions of contamination and washing as well as dressing and grooming was seen in the CPS patients.

Conclusions: Involvement of different brain structures in different epileptic syndromes, plays a role in the susceptibility to develop specific psychopathological disorders like OC symptoms or obsessive compulsive disorder which are seen more in CPS as compared to generalized seizures.

INTRODUCTION

Behavioral and emotional changes in patients with epilepsy are very common. Epilepsy especially temporal lobe epilepsy (TLE) has been associated with psychopathology ranging from mood disorders, anxiety disorders, psychosis and specific personality characteristics.¹⁻³ A link between epilepsy and the development of specific personality characteristics in patients with TLE has been studied by several researchers.⁴⁻⁶ In TLE, obsessive compulsive (OC) symptoms may be present as a discrete disorder or as a part of some other psychiatric syndrome. Though the aetiology of OC symptoms in epilepsies still remains unclear, there seems to be evidence of pathological dysfunction in the limbic system, basal ganglia and orbito-frontal region.⁷ Several studies report on OC traits or symptoms as one of the personality characteristics of TLE and involvement of the limbic system is considered

to have a pathogenic basis common to both TLE and obsessive-compulsive disorder (OCD).^{3,8,9}

Despite the heterogeneity of OC symptoms, researchers have found at least some evidence that specific neurobiological dysfunctions mediate the disorder. A number of studies published in the 1980s and 1990s reported a more specific association between OCD and epilepsy.¹⁰⁻¹³ Most of the evidence linking OCD with epilepsy has come from case studies and clinical observations, rather than from studies of large groups or comparison in different types of epilepsies. The prevalence of OCD is found to be in the range of 14%⁸ to 22%⁹ in various studies. However the prevalence of OC symptoms and traits has not been studied extensively.

Some researchers have also found that lateralization of seizures is associated with different psychopathology⁹ whereas some did not find any evidence to support the notion.¹⁴ This study was therefore designed to assess the

prevalence and type of OC symptoms in patients with complex partial and generalized seizure disorders and to study the association of OC symptoms with right or left sided lesions in patients with complex partial seizure (CPS).

METHODS

This clinical survey was conducted in the outpatient departments of psychiatry & neurology of the GSMC & KEM Hospital after obtaining the permission of the Institutional Ethics Committee in accordance with the Declaration of Helsinki. A written informed consent was obtained from the patients and their relatives after explanation. All patients were diagnosed as having seizure disorder by the neurologist depending on the clinical seizure semiology and MRI findings and diagnosed as CPS or generalized seizures based on ILAE classification of seizure disorder.¹⁵ Patients fulfilling inclusion criteria were enrolled in the study. The inclusion criteria were: 1) Patients of either sex and above 18 years suffering from only CPS or generalized seizure disorder diagnosed by the neurologist; 2) No history of any prior psychiatric illness. Patients with any other seizure semiology and those already on psychiatric medication were excluded from the study.

Ninety five patients were screened and 60 patients who satisfied the inclusion and exclusion criteria were enrolled in the 2 groups of the study. Group A: Patients having CPS (n=30). Group B: Patients having generalized seizures (n=30). A proforma was prepared to study the various demographic variables, details of seizure disorder, MRI findings and the OC symptoms were assessed with the help of the Padua Inventory (PI).

The Padua Inventory- Washington State University Revision (PI-WSUR)¹⁶ is a 39-item self-report measure of obsessions and compulsions. Each item on PI is rated on a 5-point scale according to the degree of disturbance caused by the thought or behavior (0= "not at all" to 4= "very much") and gives a total score that varies from 0 to 156 with a cut off score of 78 indicating the presence of obsessive and/or compulsive features. The PI-WSUR items are organized to measure 5 content areas relevant to OCD. These 5 areas are obsessional thoughts to harm self/others (OTAHSO; score range 0 - 28, cutoff score - 14); obsessional impulses to harm self/others (OITHSO; score range 0 - 36, cutoff score - 18); contamination obsessions and washing compulsions (COWC; score range 0 - 40, cutoff score - 20); checking compulsions (CHKC; score range 0 - 40, cutoff score - 20); and dressing/

grooming compulsions (DRGRC ; score range 0 - 12, cutoff score - 6). The PI-WSUR demonstrated good internal consistency, with α 's ranging from .77 to .88 on subscales and α 's of .92 for the total scale.

Statistical analysis

Group differences were analyzed using frequency distribution, chi square test and unpaired t test for the demographic variables, prevalence and type of OC symptoms wherever applicable. In the complex partial seizure group differences in OC symptoms and lateralization were studied using unpaired t test. Two tailed "p" values were obtained for all analyses. P value of < 0.05 was considered significant indicating 95% confidence limits.

RESULTS

Demographic and illness variables

The mean age for patients with CPS was found to be 32 ± 7.9 years and 32.9 ± 11.8 years for generalized seizure disorder. In our study in both the groups there was a male preponderance as compared to females with a male:female ratio of 5:1 in CPS group with 83% (n=25) being males and 16 % (n=5) females. In the generalized seizure group, the male:female ratio was 3:2 with 60% (n=18) males and 40% (n=12) females. The mean duration of illness was 22.8 ± 5.6 years in CPS and 9.9 ± 7.5 years in generalized seizure disorder group which was significant ($p < 0.0001$). The mean age of onset of seizures was 16.70 ± 4.82 years in CPS and 19.66 ± 2.67 years in generalized seizure disorder group which was significant ($p = 0.0046$). Majority of patients (90%) in both the groups were Hindus and belonged to the lower economic strata.

Prevalence and type of OC symptoms as per Padua inventory

All the patients were assessed for the presence of obsessions and compulsions as per the cut off scores for the total items and for the various domains. When both the groups were assessed for prevalence of OC symptoms as per the total scores of the PI then 28 (93.3%) patients with CPS had a total cutoff score more than 78, indicating the presence of OC symptoms as compared to 12 patients (40%) with generalized seizure disorder and this difference was statistically significant (Table 1).

Table 1: Prevalence of obsessive compulsive (OC) symptoms

OC symptoms as per Padua Inventory	Complex partial seizures (n=30) (%)	Generalized seizure disorder(n=30) (%)	Fishers exact testp value
Present	28 (93.3%)	12 (40%)	0.0001
Absent	2 (6.6%)	18 (60%)	
Total	30	30	

Patients in both the groups had one or more than one obsession and/or compulsion. An analysis of both the groups for the type of OC symptoms as per the cutoff scores for the various domains of the PI revealed that in the CPS group 19 patients (63.3%) had dressing and grooming compulsions, 17 patients (56.6%) had contamination obsessions and washing compulsions, whereas checking compulsions and obsessional thoughts of harm and impulses to harm were predominantly seen in 7 patients (23%) each. On the other hand in the generalized seizure group too, prevalence of dressing and grooming compulsions were seen in 5 patients (16.7%) followed by contamination obsessions and washing compulsions which was seen in 3 patients (10%). The other obsessional thoughts/ impulses to harm self or others and checking compulsions were less prevalent and were seen in a single patient each (Table 2a). When both the groups were compared for the differences in the OC symptoms then a highly statistical difference was seen on all the domains except the dressing and grooming compulsions and obsessional impulses to harm self/others; with the CPS patients having more dysfunction than the generalized seizure group (Table 2b).

OC symptoms and lateralization in complex partial seizures

All the patients were reviewed for their MRI findings. In the CPS group 11 patients had MRI

findings of right mesial temporal sclerosis (MTS), 17 patients had left MTS & 1 patient had bilateral MTS (right > left side) and 1 patient had normal MRI scan whereas in the generalized seizure group MRI findings were normal in 28 patients except for 2 patients of whom 1 had encephalomalacia and the other mild generalized cortical atrophy. None of the patients with MRI findings in the generalized seizure group had the OC symptoms.

The patient having bilateral MTS was considered for analysis with the right sided lesions as the right hippocampus was severely atrophic as compared to the left side. When the CPS patients having right and left sided lesions (n=29) were compared for differences in OC symptoms, a highly significant association between left sided temporal lobe sclerosis for obsessions of contamination and washing and dressing and grooming compulsions was seen. However for other symptoms of checking compulsions, obsessional thoughts of harm to self/others and obsessional impulses to harm self/others, no statistical significant differences between right and left sided lesions were seen (Table 3).

DISCUSSION

Demographic and illness variables

Most of our patients in both the groups had onset of seizures in their adolescence and early twenties, which is keeping in with the general

Table 2a: Type of obsessions and compulsions as per Padua Inventory in both groups

Padua Inventory Subscales	Complex partial seizure (n=30)(%)	Generalized seizure disorder (n=30) (%)
Contamination obsessions and washing compulsions	17 (56.6%)	3 (10%)
Dressing/grooming compulsions	19 (63.33%)	5 (16.7%)
Checking compulsions	7 (23.33%)	1 (3.33%)
Obsessional thoughts of harm to self/others	7 (23.33%)	1 (3.33%)
Obsessional impulses to harm self/others	2 (6.6%)	1 (3.33%)

Table 2b: Comparison of obsessive compulsive symptoms as per Padua Inventory in both groups

Padua Inventory subscales	Complex partial seizures (n=30)		Generalized seizure disorder (n=30)		t test	p value
	Mean ±	SD	Mean ±	SD		
Contamination obsessions and washing compulsions	11.3±	3.8	4.8±	3.3	7.04	0.0001
Dressing/grooming compulsions	3.77±	2.67	2.13±	1.31	3.00	0.003
Checking compulsions	7.26±	3.4	2.8±	2.68	5.58	0.0001
Obsessional thoughts of harm to self/others	4.8±	2.7	1.9±	1.9	4.7	0.0001
Obsessional impulses to harm self/others	3.81±	2.04	3±	2.309	0.94	0.35

epidemiological findings of seizure disorders.¹⁷ Among epilepsies, temporal lobe epilepsies account for the highest prevalence of focal refractory epilepsies having a longer duration of illness as they begin early in life.^{18,19} This is in keeping with our study where we found that the duration of illness was longer for CPS than generalized seizures. This could be due to the non availability of complete cure in cases of CPS due to varied aetiology of the same and also lack of awareness due to the seizure semiology. We found a male predominance in both the groups. This is in keeping with earlier studies from India where a higher prevalence was reported in males as compared to females.²⁰ This difference has been considered probably as a result of poor reporting due to cultural factors and differentially higher

mortality among female children due to poor care in India.²¹

Prevalence and type of OC symptoms

In epileptic disorders, psychopathology could exist as a disorder or the behavioural (personality) abnormalities could represent a trait (a distinguishing feature of the subject's nature) or a state (dependent on the role of the disease in the patient's life). Every individual has several personality traits which are a distinguishing feature of a subject's personal nature and may exist to a lesser or greater extent in the individual.

In our study though we did not diagnose the patients on the diagnostic criteria of OCD, they scored very highly on the PI for the OC symptoms. Our findings for OC symptoms were

Table 3: Comparison of obsessive compulsive symptoms with MRI findings in complex partial seizure group (n=28)

Padua Inventory subscales	Left sided lesion (n=17)		Right sided lesion (n=11)		t- test	p value
	Mean±	SD	Mean±	SD		
Contamination obsessions and washing compulsions	13.12 ±	3.97	9.00 ±	2.00	3.17	0.003
Dressing/grooming compulsions	5.12 ±	2.69	2.27 ±	1.19	3.28	0.002
Checking compulsions	7.12 ±	3.55	7.18 ±	3.28	0.048	0.96
Obsessional thoughts of harm to self/others	4.35 ±	2.37	5.36 ±	3.53	0.909	0.371
Obsessional impulses to harm self/others	4.41 ±	3.16	3.36 ±	2.50	0.925	0.363

more than those of previous researchers for both the types of epilepsies. Monaco *et al.*⁸ reported that OCD was under diagnosed in patients with epilepsy, probably because it was difficult for epileptologists not trained in psychiatry to make such a diagnosis, and underlining the role of neuropsychiatrists in epilepsy clinics and centres. Isaacs *et al.*⁹ using the Obsessive Compulsive Inventory (OCI) reported a 22% prevalence of OC symptoms in patients with drug-resistant TLE, which is far less than what we found in our study.

A higher prevalence of OCD in TLE has been documented by several researchers.¹⁰⁻¹³ Some researchers have used the Structured Clinical Interview for DSM-IV-TR Axis I Disorders-Patient Edition (SCID-IP) and *The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS)* to evaluate OCD prevalence in epilepsies.^{8,22} Hence using different screening tools in various studies by different researchers probably gave a difference in the prevalence rate which was also reflected in our findings. Ertekin *et al.*²² in their findings reported that OCD and multiple psychiatric comorbidities were more common in patients with TLE than in patients with idiopathic generalized epilepsy (IGE). This finding is consistent with the results of some studies²³ though some have suggested that the differences in psychopathology associated with epilepsy, should be inferred only with respect to disease severity and psychosocial reasons and not with relationship to a generalized or localized syndrome.²⁴

Monaco *et al.*⁸ found that 14.5% of 62 patients with TLE had a diagnosis of OCD, whereas there was no co-morbid OCD among 20 patients with IGE. They reported that obsessionality was a trait in TLE patients and only those with a biological vulnerability (indicated by the previous psychiatric history) developed OCD indicating a link between these personality traits and the involvement of mesolimbic structures. Other researchers have also found that in addition to clinical obsessions and compulsions, obsessive personality traits were also quite prevalent in epilepsy patients which resulted in a poor quality of life.^{25,26} In refractory mesial temporal epilepsy, Sawant and Wankhede had found a prevalence of OCD in 15% of the patients.²⁷

The most common type of obsessions found by us in both groups were ritualistic behaviours associated with dressing, undressing, washing self, folding clothes etc which had to be done in a particular order or way. This was followed by obsessions of contamination with dirt and compulsions of washing. In our study, CPS

patients had more aggressive thoughts of harming others and checking compulsions were higher than the generalized seizure group. Ertekin *et al.*²² also found obsessions of contamination, need for symmetry/exactness and aggressive thoughts to be more common in the TLE patients as compared to IGE patients. Among the compulsions ordering, washing and checking were more frequent. Isaacs *et al.*⁹ found greater washing, ordering, checking, hoarding, doubting, and neutralizing in their TLE patients. According to them doubting, checking, and hoarding represents the effects of behavioural impairments in patients with TLE associated with problems in memory whereas hoarding would reflect deficits in organization due to frontal lobe problems.

The higher rates of OC symptoms in patients with TLE suggest that involvement of the temporal lobe may play a role in the development of specific psychopathological syndromes. Rauch *et al.*²⁸ reported that the amygdala was crucial to development of affective and motivational elements of OCD. The amygdala has dense connections with the striatum that are presumed to support an efficient system for driving automated behavior in response to danger, while reciprocal connections with the extended amygdala, including the ventral striatum and the bed nucleus of the striaterminalis, help to mediate the anxiolytic by-products of repetitive behaviors.²⁹ Kroll and Drummond¹² have suggested that the co-morbidity of OCD and TLE might be due to kindling. The theory of kindling is that focal chemical or electrical brain stimulation can later result in epilepsy and if this occurs in the limbic circuit it can induce OCD. Thus no single region can be attributed to OCD and TLE as several regions such as the basal ganglia, cingulate, and frontal areas^{30,31} as well as the limbic areas have been implicated.^{11,13,32}

OC symptoms and lateralization in complex partial seizures

We found a highly significant association between OC symptoms and left sided MTS as compared to right MTS. Our findings are in keeping with those of Ertekin *et al.*²² who found that left-sided lesions were more likely to be associated with OCD and OCD-depression comorbidity. However some case reports or small series have reported a right sided structural abnormality as seen on MRI or EEG asymmetries for development of OCD in TLE.³²⁻³³ Isaacs *et al.*⁹ found that patients with right-sided seizures scored an average of 10

points higher on the OCI Obsessive Compulsive Inventory than those with left sided seizures, but this difference did not reach the level of statistical significance. Meanwhile, there were no differences in OCD with respect to laterality of the EEG and/or MRI focus in the Monaco *et al.* study.⁸ Schmitz *et al.*¹⁴ also did not find any association between laterality of TLE with varying degrees of personality characteristics or obsessionality.

Though previous studies have not documented the most common types of obsessions seen in right or left MTS, our findings reflected the need for exactness and obsessions of contamination and compulsions of washing as the most common OC symptoms seen in left MTS but patients with OCD were found in some reports or studies to have left- or right-sided epileptic foci.^{12,28}

Huey *et al.*²⁹ did studies using functional MRI, MRI and positron emission tomography in patients having OCD in other neurological disorders and compared them to patients with idiopathic OCD. They postulated that three regions were implicated in both types of OCD: orbitofrontal cortex which directs appropriate behaviour, the basal ganglia which acts as a gate in connecting behaviours to subsequent reward, and the anterior cingulate region which modulates perception of which behavioural “choice” will result in reward. Patients with OCD from neurological disease had less anxiety with the compulsion than did those with the idiopathic form. An understanding of all these studies would therefore infer that there is a shared organization between the OC symptoms and epilepsy in the brain which probably would not be associated with laterality of seizures.

Our study has several limitations. The sample size was small and reflected a selection bias of the patient group seen at a tertiary care hospital and may not reflect the findings seen in general population. Though the patients were assessed by psychiatrists we did not use diagnostic criteria for the detection of OCD in the patients. However our study does corroborate the findings of previous studies that the involvement of different brain structures in different epileptic syndromes, plays a role in the susceptibility to develop specific psychopathological disorders like OC symptoms or OCD which are seen more in complex partial seizures as compared to generalized seizures.

In conclusion, we found a high prevalence of OC symptoms in the CPS group as compared to previous researchers which emphasizes the need to detect the symptoms early so as to improve the quality of life of the patients and provide optimum management of the epilepsy as well as

the psychopathology associated with epilepsy.

Multicenter studies using structured clinical interview to establish psychiatric diagnoses, structured tools and scales sensitive to detection of OC symptoms in epilepsy patients with studies aimed at neurobiological research to understand the structural relationship between OC symptoms and epilepsy would help in our understanding of these co-morbid conditions.

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DISCLOSURE

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