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ORIGINAL RESEARCH

A study to assess the various personality traits, and neuroimaging findings in patients presenting with epilepsy

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ABSTRACT

Background: Epilepsy is more common than is generally appreciated; almost 10% of the population will have at least one seizure during their lifetime. We analyzed the location of the epileptic discharge and investigated the underlying factors related to the personality traits. **Materials & Methods:** 100 patients at the department of Psychiatry and department of Radiology MMIMSR, Mullana, Ambala were selected. Parameters such as age, sex, residence, marital status, education, occupation, chief complaints significant past psychiatric and medical history was recorded. M.I.N.I scale and IPDE questionaire was used in the study. **Results:** There was significant association between personality traits and localisation of epileptogenic zone (P< 0.05). There was non- significant association between MRI changes such as cavernomas in 4, gliosis in 11, mesial temporal sclerosis in 4 and NCC and localisation of epileptogenic zone (P> 0.05). Duration of years <5 years was seen in 64, 6 to 10 years in 25 and >10 years in 11. Frequency of seizure episode was monthly in 5 and yearly in 95. Localisation epileptogenic zone was nil in 61, non-temporal lobe epilepsy in 18 and temporal lobe epilepsy in 21. Number of AEDs was monotherapy in 49, polytherapy in 51. **Conclusion:** Epileptic seizures are likely to have a negative impact on personality development.

Key words: Epilepsy, mesial temporal sclerosis, MRI

INTRODUCTION

Epilepsy is more common than is generally appreciated; almost 10% of the population will have at least one seizure during their lifetime. Overall, complex partial seizures are the most common seizure type across age groups. Generalized seizures are more common in children, and partial seizures are more common in adults.[1] Incidence of partial seizures remains constant at 20 per 100,000 population from infancy until age 65 years, when it increases sharply. Any process that causes alteration of the structure (macroscopic or microscopic) or function of cerebral neurons predisposes to epilepsy. Common causes of provoked seizures Metabolic abnormalities Hypoglycemia and hyperglycemia Hyponatremia Hypocalcemia Alcohol withdrawal, Acute neurological insult Infection (meningitis, encephalitis) Stroke (ischemic, hemorrhagic) Head trauma Illicit drug intoxication and withdrawal.[2]

Personality is the sum of the physical, social, emotional, and mental properties of individuals. Normal personality characteristics should involve a degree of self-consciousness and self-control ability. Patients with epilepsy display particular personality traits including low self-directedness, high novelty seeking, harm avoidance, and impulsiveness. However, the underlying causes for the observed personality traits remain controversial. It is currently unclear if the observed abnormities in patients with epilepsy are affected by social psychological factors or associated with biological changes resulting from epilepsy. The frontal lobe was involved in the pathophysiology of cluster B personality disorders, which might indicate the impact of this region on mood and affective regulation, as well as impulsivity and social behaviour.[3] In the same context, the temporal lobe was also found to be associated with the following personality traits: interpersonal sensitivity,

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irritability, and social introversion in patients with epilepsy. Further, several studies have proposed that personality can be affected by epileptic related factors including the type of seizure, age at seizure onset, duration of epilepsy, seizure frequency, and certain antiepileptic drugs. However, it is currently unclear if personality have a common underlying pathological basis.[4] At present, attaining a seizure-free status is the ideal target of epilepsy treatments. However, abnormal personality traits should also be included in the strategies of treatment. Therefore, in this study, we aimed to evaluate personality traits in patients with epilepsy.[5] Moreover, we analyzed the location of the epileptic discharge and investigated the underlying factors related to the personality traits.

MATERIAL AND METHODS

This study was carried out on 100 patients at the department of Psychiatry and department of Radiology MMIMSR, Mullana, Ambala. The sample was collected from the patients attending in patient services of Department of psychiatry. All those patients meeting inclusion criteria and exclusion criteria were considered for study. Inclusion criteria was age 18-60 years, either gender and all type of Epilepsy patient at least duration of minimum 2 years. Exclusion criteria was non cooperative patients and speech or hearing disability.

A special self-designed semi structured Performa was used to gather the information about socio-demographic and clinical details about the subjects such as age, sex, residence, marital status, education, occupation, chief complaints significant past psychiatric and medical history. M.I.N.I scale and IPDE questionaire was used in the study. Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. Categorical data was represented in the form of Frequencies and proportions. Chi-square test was used as test of significance for qualitative data.

RESULTS

Table 1: General Profile of subjects

		Count	Percentage
Age	<20 years	8	8.0%
	21 to 30 years	44	44.0%
	31 to 40 years	24	24.0%
	41 to 50 years	13	13.0%
	61 to 60 years	11	11.0%
Sex	Female	68	68.0%
	Male	32	32.0%
Education	Illiterate	25	25.0%
	Primary	23	23.0%
	High school	32	32.0%
	PUC	6	6.0%
	Graduate	14	14.0%
Marital status	Married	62	62.0%
	Single	38	38.0%
Religion	Hindu	59	59.0%
	Muslim	22	22.0%
	Sikh	19	19.0%
Location	Rural	65	65.0%
	Urban	35	35.0%

Table I shows that maximum subjects 44 (44.0%) were seen in age group 21 to 30 years. 68 were female and 32 were male. Maximum subjects 32 (32%) had high school education. 62 were married and 38 single, 59 were Hindu, 22 Muslim and 19 Sikh, 65 had rural and 35 had urban background.

Table 2: Localisation of epileptogenic zone distribution

Localisation epileptogenic zone	Count	%
Nil	61	61.0%
Non-Temporal lobe epilepsy	18	18.0%
Temporal lobe epilepsy	21	21.0%
Total	100	100.0%

Localisation epileptogenic zone was nil in 61, non- temporal lobe epilepsy in 18 and temporal lobe epilepsy in 21 cases.

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Table 3: Association between localisation of epileptogenic zone and general profile of subjects

		Group						P value
		TLE		Non TLE		Total		
		Count	%	Count	%	Count	%	
Age	<20 years	0	0.0%	0	0.0%	0	0.0%	0.122
	21 to 30 years	8	38.1%	6	33.3%	14	35.9%	
	31 to 40 years	9	42.9%	5	27.8%	14	35.9%	
	41 to 50 years	1	4.8%	6	33.3%	7	17.9%	
	61 to 60 years	3	14.3%	1	5.6%	4	10.3%	
Sex	Female	14	66.7%	13	72.2%	27	69.2%	0.708
	Male	7	33.3%	5	27.8%	12	30.8%	
Education	Illiterate	4	19.0%	5	27.8%	9	23.1%	0.504
	Primary	4	19.0%	3	16.7%	7	17.9%	
	High school	6	28.6%	8	44.4%	14	35.9%	
	PUC	1	4.8%	0	0.0%	1	2.6%	
	Graduate	6	28.6%	2	11.1%	8	20.5%	
Marital status	Married	16	76.2%	16	88.9%	32	82.1%	0.303
	Single	5	23.8%	2	11.1%	7	17.9%	
Religion	Hindu	11	52.4%	11	61.1%	22	56.4%	0.100
	Muslim	1	4.8%	4	22.2%	5	12.8%	
	Sikh	9	42.9%	3	16.7%	12	30.8%	
Location	Rural	14	66.7%	13	72.2%	27	69.2%	0.708
	Urban	7	33.3%	5	27.8%	12	30.8%	

There was no association between localisation of epileptogenic zone and age, gender, education, marital status, religion and location (P> 0.05).

Table 4: Personality traits distribution

Personality traits	Count	%
Anankastic	8	8.0%
Antisocial	7	7.0%
Anxious	18	18.0%
Avoidant	14	14.0%
Borderline	8	8.0%
Dependant	12	12.0%
Histrionic	6	6.0%
Impulsive	5	5.0%
Obsessive-compulsive	9	9.0%
Paranoid	8	8.0%
Schizoid	5	5.0%
Total	100	100.0%

Personality traits was anankastic seen in 8, antisocial in 7, anxious in 18, avoidant in 14, borderline in 8, dependant in 12, histrionic in 6, impulsive in 5, obsessive- compulsive in 9, paranoid in 8 and schizoid in 5.

Table 5: Association between Personality traits and Localisation of epileptogenic zone

Personality traits	TLE		Non TLE		Total	
	Count	%	Count	%	Count	%
Anankastic	2	9.5%	1	5.6%	3	7.7%
Antisocial	2	9.5%	2	11.1%	4	10.3%
Anxious	3	14.3%	3	16.7%	6	15.4%
Avoidant	2	9.5%	4	22.2%	6	15.4%
Borderline	0	0.0%	1	5.6%	1	2.6%
Dependant	0	0.0%	3	16.7%	3	7.7%
Histrionic	4	19.0%	0	0.0%	4	10.3%
Impulsive	0	0.0%	1	5.6%	1	2.6%
Obsessive-compulsive	1	4.8%	3	16.7%	4	10.3%
Paranoid	4	19.0%	0	0.0%	4	10.3%
Schizoid	3	14.3%	0	0.0%	3	7.7%
Total	21	100.0%	18	100.0%	39	100.0%

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χ 2 =17.87, df =10, p = 0.057 **[Chi-square test]**
There was significant association between personality traits and localisation of epileptogenic zone (P< 0.05).

Table 6: MRI changes distribution

MRI changes	Count	%
Cavernomas	4	4.0%
Gliosis	11	11.0%
Mesial temporal sclerosis	4	4.0%
NCC	14	14.0%
Normal	67	67.0%

MRI changes showed cavernomas in 4, gliosis in 11, mesial temporal sclerosis in 4 and NCC in 14 patients.

Table 7: Association between MRI changes and localisation of epileptogenic zone

MRI changes	TLE		Non TLE		Total	
	Count	%	Count	%	Count	%
Cavernomas	3	14.3%	1	5.6%	4	10.3%
Gliosis	6	28.6%	5	27.8%	11	28.2%
Mesial temporal sclerosis	4	19.0%	0	0.0%	4	10.3%
NCC	7	33.3%	7	38.9%	14	35.9%
Normal	1	4.8%	5	27.8%	6	15.4%

χ 2 =7.572, df =4, p =0.109 **[Chi-square test]**
There was non- significant association between MRI changes such as cavernomas in 4, gliosis in 11, mesial temporal sclerosis in 4 and NCC and localisation of epileptogenic zone (P> 0.05).

Table 8: Characteristics of epilepsy

Parameters	Variables	Count	%
Duration of years	<5 years	64	64.0%
	6 to 10 years	25	25.0%
	>10 years	11	11.0%
Frequency of seizure episode	Monthly	5	5.0%
	Yearly	95	95.0%
Localisation epileptogenic zone	Nil	61	61.0%
	Non-Temporal lobe epilepsy	18	18.0%
	Temporal lobe epilepsy	21	21.0%
Number of AEDs	Monotherapy	49	49.0%
	polytherapy	51	51.0%

Duration of years <5 years was seen in 64, 6 to 10 years in 25 and >10 years in 11. Frequency of seizure episode was monthly in 5 and yearly in 95. Localisation epileptogenic zone was nil in 61, non-temporal lobe epilepsy in 18 and temporal lobe epilepsy in 21. Number of AEDs was monotherapy in 49, polytherapy in 51.

Table 9: Association between personality traits and duration

Personality traits	Duration of years					
	<5 years		6 to 10 years		>10 years	
	Count	%	Count	%	Count	%
Anankastic	5	62.5%	3	37.5%	0	0.0%
Antisocial	4	57.1%	0	0.0%	3	42.9%
Anxious	14	77.8%	2	11.1%	2	11.1%
Avoidant	8	57.1%	2	14.3%	4	28.6%
Borderline	3	37.5%	5	62.5%	0	0.0%
Dependant	7	58.3%	5	41.7%	0	0.0%
Histrionic	5	83.3%	1	16.7%	0	0.0%
Impulsive	3	60.0%	2	40.0%	0	0.0%
Obsessive-compulsive	6	66.7%	3	33.3%	0	0.0%
Paranoid	5	62.5%	2	25.0%	1	12.5%
Schizoid	4	80.0%	0	0.0%	1	20.0%

χ 2 =30.48, df =20, p =0.062 **[Chi-square test]**
There was no association between personality traits and duration (P> 0.05).

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Table 10: Association between personality traits and frequency of seizure

		Frequency of seizure episode			
		Monthly		Yearly	
		Count	%	Count	%
Personality traits	Anankastic	0	0.0%	8	100.0%
	Antisocial	2	28.6%	5	71.4%
	Anxious	0	0.0%	18	100.0%
	Avoidant	0	0.0%	14	100.0%
	Borderline	0	0.0%	8	100.0%
	Dependant	0	0.0%	12	100.0%
	Histrionic	2	33.3%	4	66.7%
	Impulsive	1	20.0%	4	80.0%
	Obsessive-compulsive	0	0.0%	9	100.0%
	Paranoid	0	0.0%	8	100.0%
	Schizoid	0	0.0%	5	100.0%

χ 2 =25.013, df =10, p =0.005* **[Chi-square test]**
There was association between personality traits and frequency of seizure (P< 0.05).

Table 11: Association between personality traits and localisation epileptogenic zone

		Localisation epileptogenic zone					
		Nil		Non-Temporal lobe epilepsy		Temporal lobe epilepsy	
		Count	%	Count	%	Count	%
Personality traits	Anankastic	5	62.5%	1	12.5%	2	25.0%
	Antisocial	3	42.9%	2	28.6%	2	28.6%
	Anxious	12	66.7%	3	16.7%	3	16.7%
	Avoidant	8	57.1%	4	28.6%	2	14.3%
	Borderline	7	87.5%	1	12.5%	0	0.0%
	Dependant	9	75.0%	3	25.0%	0	0.0%
	Histrionic	2	33.3%	0	0.0%	4	66.7%
	Impulsive	4	80.0%	1	20.0%	0	0.0%
	Obsessive-compulsive	5	55.6%	3	33.3%	1	11.1%
	Paranoid	4	50.0%	0	0.0%	4	50.0%
	Schizoid	2	40.0%	0	0.0%	3	60.0%

χ 2 =29.119, df =20, p =0.085 **[Chi-square test]**
There was no association between personality traits and localisation epileptogenic zone (P> 0.05).

Table 12: Association between personality traits and number of AEDs

		Number of AEDs					
		Monotherapy		polytherapy		Polytherapy	
		Count	%	Count	%	Count	%
Personality traits	Anankastic	4	50.0%	0	0.0%	4	50.0%
	Antisocial	3	42.9%	0	0.0%	4	57.1%
	Anxious	9	50.0%	0	0.0%	9	50.0%
	Avoidant	8	57.1%	0	0.0%	6	42.9%
	Borderline	7	87.5%	0	0.0%	1	12.5%
	Dependant	9	75.0%	0	0.0%	3	25.0%
	Histrionic	0	0.0%	0	0.0%	6	100.0%
	Impulsive	4	80.0%	0	0.0%	1	20.0%
	Obsessive-compulsive	2	22.2%	0	0.0%	7	77.8%
	Paranoid	3	37.5%	1	12.5%	4	50.0%
	Schizoid	0	0.0%	0	0.0%	5	100.0%

χ 2 =35.48, df =20, p = 0.018* **[Chi-square test]**
There was association between personality traits and number of AEDs (P< 0.05).

DISCUSSION

Temporal lobe epilepsy (TLE) is considered to present a relatively specific risk factor, notably for affective disorders, because of the major involvement of the limbic system both in seizure generation in TLE and in the regulation of affect and mood.[6] Numerous studies have reported an increased rate of psychiatric disturbances in patients with TLE, compared with

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patients with other types of epilepsy. The laterality of the seizure focus has also been considered as a potential risk factor for psychiatric illness in epilepsy.[7] Some authors emphasize the role of the right hemisphere which is suggested to have more extensive limbic connections than the left hemisphere, whereas the majority of the studies implicate the left hemisphere or find no effect of lateralization at all.[8] Although support exists for the association between epilepsy and psychiatric disorders, the empiric evidence for a specific association between the localization and lateralization of the epileptogenic zone in partial epilepsy and psychiatric morbidity remains equivocal.[9] The present study analyzed the location of the epileptic discharge and investigated the underlying factors related to the personality traits.

We found that maximum subjects 44 (44.0%) were seen in age group 21 to 30 years. 68 were female and 32 were male. Maximum subjects 32 (32%) had high school education. 62 were married and 38 single, 59 were Hindu, 22 Muslim and 19 Sikh, 65 had rural and 35 had urban background. Swinkels et al[10] studied 64 patients with extra-TLE and 67 patients with temporal lobe epilepsy (TLE). Using a wide range of standardized diagnostic tools, all patients were evaluated for their varied psychopathological characteristics. In contrast to individuals with extra-TLE, they did not observe the expected excess of mental symptoms in patients with (mesial) TLE. Additionally, they discovered no differences between patients with epilepsy that has lateralized in the left versus the right hemisphere.

We found that localisation epileptogenic zone was nil in 61, non- temporal lobe epilepsy in 18 and temporal lobe epilepsy in 21 cases. There was no association between localisation of epileptogenic zone and age, gender, education, marital status, religion and location (P> 0.05). We found that Personality traits was anankastic seen in 8, antisocial in 7, anxious in 18, avoidant in 14, borderline in 8, dependant in 12, histrionic in 6, impulsive in 5, obsessive- compulsive in 9, paranoid in 8 and schizoid in 5. There was significant association between personality traits and localisation of epileptogenic zone (P< 0.05). Perini et al[11] found that in comparison to patients with juvenile myoclonic epilepsy (22%) and diabetic patients (10%), 16 (80%) individuals with temporal lobe epilepsy met the criteria for a mental diagnosis at the SADS interview. The most prevalent condition in people with temporal lobe epilepsy was a mood disorder: 11 (55%) of the patients had depression, compared to two diabetic individuals and three people with juvenile myoclonic epilepsy (P 0.001). Eight patients with affective disorder and temporal lobe epilepsy also had a personality or anxiety issue. On the BDI, STAIX1, and STAIX2, patients with temporal lobe epilepsy performed significantly better than the three control groups.

We found that MRI changes showed cavernomas in 4, gliosis in 11, mesial temporal sclerosis in 4 and NCC in 14 patients. There was non- significant association between MRI changes such as cavernomas in 4, gliosis in 11, mesial temporal sclerosis in 4 and NCC and localisation of epileptogenic zone (P> 0.05). We found that duration of years <5 years was seen in 64, 6 to 10 years in 25 and >10 years in 11. Frequency of seizure episode was monthly in 5 and yearly in 95. Localisation epileptogenic zone was nil in 61, non-temporal lobe epilepsy in 18 and temporal lobe epilepsy in 21. Number of AEDs was monotherapy in 49, polytherapy in 51. There was no association between personality traits and duration (P> 0.05). There was association between personality traits and frequency of seizure (P< 0.05). There was no association between personality traits and localisation epileptogenic zone (P> 0.05). There was association between personality traits and number of AEDs (P< 0.05). Swinkels et al[12] studied the association of PD traits with epilepsy-related variables was studied, as well as the association between PD traits and level of psychopathology. The results showed that, compared with the control group, patients with epilepsy had higher dimensional VKP scores for several Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and International Classification of Diseases (ICD-10) PDs. Associations were found between PD traits and age at onset of epilepsy, duration of epilepsy, seizure frequency and number of anti-epileptic drugs. Anxiety and depression were not associated with PD traits.

CONCLUSION

Epileptic seizures are likely to have a negative impact on personality development.

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