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A clinical study on seizure disorder in intellectually disabled patients in Barak Valley, North-Eastern India

Kamal Nath[1], Subrata Naskar[2]

[1]Associate Professor, Department of Psychiatry, Silchar Medical College and Hospital, Silchar, Assam, India, [2]Postgraduate Trainee, Department of Psychiatry, Silchar Medical College and Hospital, Silchar, Assam, India

Corresponding author: Dr. Subrata Naskar, Postgraduate Trainee, Department of Psychiatry, Silchar Medical College and Hospital, Ghungoor, Silchar-788014, Assam, India. nsubrata09@gmail.com

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Abstract

Background: Intellectual disability (ID) is a state of developmental deficit, beginning in childhood which results in significant limitation of intellect or cognition and poor adaption to the demands of everyday life. The relationship between seizure disorders and ID, and their socio-demographic correlations is a current topic of research to implement proper psychosocial interventions and to eliminate the preventable causes of ID as well as seizure disorder. **Aims:** To find out the prevalence of seizure disorders and their types in the intellectually disabled patients, and find out their socio-demographic correlations. **Materials and methods:** A cross-sectional study sample comprising of 100 intellectually disabled patients of Silchar Medical College and Hospital was taken, and the study was conducted after obtaining institutional ethical committee approval and permission from the college. Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) criteria were used for diagnosing ID. A standardised proforma describing socio-demographic variables, Malin's Intelligence Scale for Indian Children (MISIC) for children in age group six to 17 years, Wechsler Adult Intelligence Scale, third edition for subjects above 18 years, and the Vineland Social Maturity Scale were applied to diagnose and classify ID. International League Against Epilepsy guidelines were used to classify seizure disorder. **Results:** Prevalence of seizure disorder was found to be 22% among the intellectually disabled population in our sample. A significant association was found between the severity of ID and increased incidence of seizure disorder (p=0.0045). Seizure disorder was more prevalent in the low intelligence quotient (IQ) group (p=0.0067). Generalised tonic clonic seizure (GTCS) was the commonest among the types of seizure disorder (n=11, 50%). Among the GTCS cases, eight out of 11 (72.7%) were from severe/profound ID group and from an IQ range of one to 35. **Conclusion:** A strong association was observed in our study between seizure disorder and poor IQ group, and with increasing severity of ID (severe and profound ID). As expected, GTCS variety was found to be more strongly associated out of all types of seizures with the groups of poor IQ and severe forms of ID. In addition, we have also observed a significant association between seizure disorder, ID, and few important socio-demographic variables.

Keywords: Developmental Disorder. Cognition. Adaptation. Demography.

Introduction

The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)[1] defines intellectual disability (ID) as a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, social, and practical domains. It affects approximately one to four per cent of the population in developed countries.[2] In general, it is considered that two per cent of the Indian population constitutes persons with this disability.[3]

The definition of epileptic seizure accepted by the International League Against Epilepsy (ILAE)[4] is "a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain." It was Gowers[5] who first explained about the possible relationship between seizure disorder and intellectual disability. He explained that "certain cerebral deformity" may be the cardinal reason behind both of them. O'Donohoe[6] inferred that true prevalence of epilepsy in intellectually disabled individual is difficult to estimate; but, he was certain that the proportion increases as the severity of ID increases. It has been established in numerous studies that ID and seizure disorders are highly correlated, and may have common aetiologies in many a times. It is also true that repeated seizure attacks in an otherwise normal neonate may give rise to ID. The various psychosocial, demographic factors and stressors that a mother faces during pregnancy also influence the intellectual development of the growing child after his or her birth. Hence, the study of correlations between these various socio-demographic factors in the intellectually disabled population with seizure disorder is a worthy area of research.

In this part of India, a lot of patients with ID are attending the outpatient and inpatient departments of Silchar Medical College and Hospital (SMCH), Assam. But, no such studies have been conducted here before. This study is an attempt to find out the prevalence of seizure disorder and its types, and different related socio-demographic variables in these patients, attending this tertiary care health centre.

Aims and objectives

1. To find out the prevalence of seizure disorders and its types in the intellectually disabled patients.
2. To correlate the different important socio-demographic variables in intellectually disabled patients with seizure disorder.

Materials and methods

Case: Any patient above the age of four years attending the inpatient or outpatient department of the Department of Psychiatry, SMCH fulfilling the DSM-5 criteria for ID.[1]

Place of study: This study was conducted in SMCH, which is a tertiary care centre. The average patients coming to the hospital is about 800-1000 per day. The study was started after taking proper approval of the institutional ethical committee.

Catchment area: Main catchment area of this hospital is the whole Barak Valley, which comprises of the districts of Cachar, Karimganj, and Hailakandi, and along with the neighbouring states like Manipur, Mizoram, and Tripura.

Selection criteria: Cases from both the sex were included. All patients above the age of four years were included in the study. Seizure disorder patients were diagnosed as per guidelines provided by ILAE.[4]

Regarding age, we have not selected any case below four years, particularly because at times it becomes extremely difficult to differentiate between the types of ID below this age.

Exclusion criteria: Patients suffering from other severe debilitating diseases, patients with history of any type of substance abuse, patients' parents/guardians not giving consent to participate in study, if the information provided is not adequate or reliable.

Sampling procedures: Cases were selected serially both from outpatient and inpatient department of the Department of Psychiatry of SMCH. A total of 100 patients were selected who fulfil the diagnostic criteria according to DSM-5.[1]

Description of tools

I. Socio-demographic proforma:
   a. A standard proforma, describing socio-demographic variables, was used which was designed and standardised in the Department of Psychiatry, SMCH.
   b. The socio-demographic proforma informs of age, gender, religions, family type, domicile, socioeconomic status, education of subject, education of parents.

II. DSM-5 criteria were used for diagnosing ID, which are:[1]
   a. Deficits in intellectual functions, such as reasoning, problem solving, planning, abstract thinking, judgement, academic learning, and learning from experience, confirmed by both clinical assessment and individualised, standardised intelligence testing.
   b. Deficits in adaptive functioning that result in failure to meet developmental and socio-cultural standards for personal independence and social responsibility. Without ongoing support, the adaptive deficits limit functioning in one or more activities of daily life, such as communication, social participation, and independent living, across multiple environments, such as home, school, work, and community.
   c. Onset of intellectual and adaptive deficits during the developmental period.

III. Seizure disorder patients were classified as per guidelines provided by ILAE.[4]

IV. Scales used:
   1. Malin's Intelligence Scale for Indian Children (MISIC),[7] an Indian adaptation of Wechsler Intelligence Scale for Children (WISC-III) was used for individual intelligence test for age group of six to 17 years. This scale was developed by Dr Arthur J Malin.
   2. Wechsler Adult Intelligence Scale, third edition (WAIS-III)[8] was applied to subjects above 18 years of age.
   3. Vineland Social Maturity Scale (VSMS) was applied to assess the adaptive behaviour in the subjects. The scale was originally developed by EA Doll in 1935, which was then adapted by Malin in the year 1965. It is used to measure differential social capacity of an individual and it provides an estimate of social age (SA) and social quotient (SQ). VSMS shows high co-relation (0.80) with intelligence and is designed to measure social maturation in eight social areas. The scale consists of 89 items divided into 13 age groups. It can be used for the age group from birth to 15 years.[9]

The IQ score estimation as well as the adaptive behaviour scoring in our study was done by an experienced clinical psychologist who also happens to be a faculty of this institution.

Interview procedure: After obtaining the informed consents from their parents/guardians, all subjects were interviewed without time limit, in details, using the various tools to elicit the maximum data and confidentiality was maintained. Parents or the caregivers were also interviewed where it was necessary.

Scoring: Scoring was done as described by the manuals for the three types of scales applied, i.e. MISIC, WAIS-III, and VSMS. According to IQ scores and adaptive behaviour scores obtained, the study subjects were classified as having mild, moderate, severe or profound ID respectively.

Analysis of data: Data was collected and tabulated, and appropriate statistical tests like chi-square and Fisher's exact t-test were applied to evaluate p-value whenever it was required,

to test the significance. The Statistical Package for the Social Sciences (SPSS v 22) was used for analysis of the collected data.

Results and observations

The socio-demographic data obtained from the subjects is tabulated in Table 1. Here, we find that most of the subjects were from the age group of 11-20 years (43%), 59% being male. Fifty per cent of our study sample was Hindus, whereas 46% were Muslims. Most were illiterates (56%), from lower middle class socioeconomic group (49%), joint families (59%), rural background (52%) with a paternal education up to primary school (38%) and illiteracy prevailing among mothers (52%), and most parents working as an unskilled labour (46%). The mean IQ of the study population was 47.95 ± 13.0061, the minimum being 19 and maximum 70.

In our study, we found that seizure disorder was present in 22% of the intellectually disabled subjects (Figure 1).

47.06% of severe intellectually disabled subjects, 20% of the moderately disabled, and 11.9% of the mildly disabled subjects had comorbid seizure disorder. The only subject with profound disability had seizure (100%) (Figure 2 and Table 2A). So, we see here that with the increase in severity of ID, there is an increased prevalence of seizure disorder (Figure 3). This result is highly statistically significant

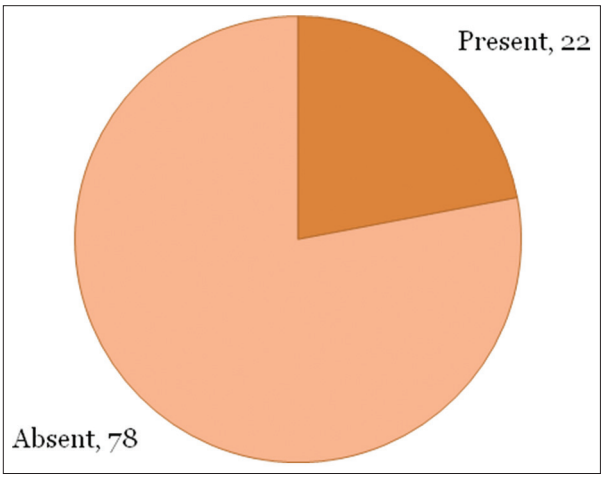

Figure 1: Prevalence of seizure disorders in intellectually disabled population.

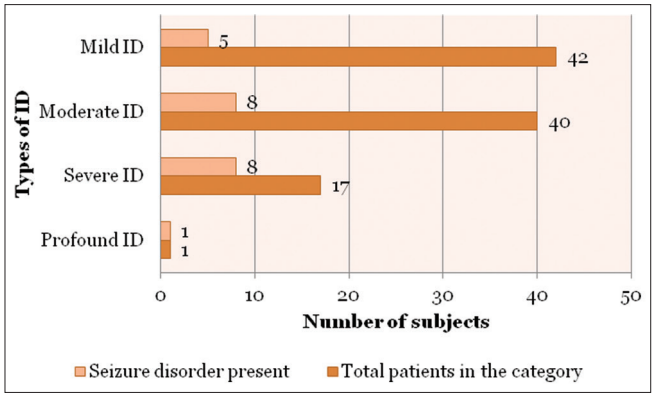

Figure 2: Prevalence of seizure disorder in different types of ID groups. ID=Intellectual disability.

Table 1: The socio-demographic data of total study subjects

Variables	Total ID subjects	Seizure disorder (%)	
		Absent	Present
Age (years)			
1-10	31	24 (30.77)	7 (31.82)
11-20	43	32 (41.03)	11 (50)
21-30	14	13 (16.67)	1 (4.55)
31-40	9	8 (10.26)	1 (4.55)
41-50	2	1 (1.28)	1 (4.55)
51-60	1	0	1 (4.55)
Grand total	100	78 (100)	22 (100)
Sex			
Female	41	31 (39.74)	10 (45.45)
Male	59	47 (60.26)	12 (54.55)
Grand total	100	78 (100)	22 (100)
Religion			
Christian	4	2 (2.56)	2 (9.09)
Hindu	50	40 (51.28)	10 (45.45)
Muslim	46	36 (46.15)	10 (45.45)
Grand total	100	78 (100)	22 (100)
Domicile			
Rural	52	41 (52.56)	11 (50)
Semi-urban	19	14 (17.95)	5 (22.73)
Urban	29	23 (29.49)	6 (27.27)
Grand total	100	78 (100)	22 (100)
Type of family			
Extended	5	4 (5.13)	1 (4.55)
Joint	49	38 (48.72)	11 (50)
Nuclear	46	36 (46.15)	10 (45.45)
Grand total	100	78 (100)	22 (100)
Education of subject			
Illiterate	59	40 (51.28)	19 (86.36)
Primary	33	30 (38.46)	3 (13.64)
Secondary	8	8 (10.26)	0
Grand total	100	78 (100)	22 (100)
Education of father			
Illiterate	30	24 (30.77)	6 (27.27)
Primary	38	30 (38.46)	8 (36.36)
Secondary	19	13 (16.67)	6 (27.27)
Higher secondary	5	5 (6.41)	0
Graduation and above	8	6 (7.69)	2 (9.09)
Grand total	100	78 (100)	22 (100)
Education of mother			
Illiterate	52	42 (53.85)	10 (45.45)
Primary	30	24 (30.77)	6 (27.27)
Secondary	10	6 (7.69)	4 (18.18)
Higher secondary	7	6 (7.69)	1 (4.55)
Graduation	1	0	1 (4.55)
Grand total	100	78 (100)	22 (100)
Socioeconomic status			
Lower	27	22 (28.21)	5 (22.73)
Lower middle	49	38 (48.72)	11 (50)
Middle	18	13 (16.67)	5 (22.73)
Upper middle	6	5 (6.41)	1 (4.55)
Grand total	100	78 (100)	22 (100)
Occupation of parents			
Business	19	13 (16.67)	6 (27.27)
Professional	3	3 (3.85)	0
Retired	4	3 (3.85)	1 (4.55)
Service	7	5 (6.41)	2 (9.09)
Skilled worker	16	12 (15.38)	4 (18.18)
Unemployed	5	5 (6.41)	0
Unskilled worker	46	37 (47.44)	9 (40.91)
Grand total	100	78 (100)	22 (100)

ID=Intellectual disability

at p=0.0045 (Table 2A). Within the group who had IQ less than 35, 50% of the subjects had comorbid seizure disorder, whereas only 16.67% of the subjects having IQ more than 35 had comorbid seizure disorder. This finding is statistically significant with p-value = 0.0067 (Table 2B).

To evaluate the correlations between the various socio-demographic variables and seizure disorder in our study population, we have re-tabulated the data and the correlations obtained are shown in Table 3. Among the various socio-demographic variables, we have found a statistically significant association between the literacy of the study subjects and seizure disorder (p=0.0031).

We were able to identify five types of seizure disorders among our study subjects; those being generalised tonic clonic seizure (GTCS, 50%), absence seizure (23%), complex partial seizure (nine per cent), simple partial seizure (nine per cent), and partial seizure with secondary generalisation (nine per cent) (Figure 4).

The various socio-demographic data according to the type of seizure disorders is shown in Table 4A. Complex partial seizure, simple partial seizure, and partial seizure secondarily generalised has been grouped together as 'others' as the data obtained in these individual category is minimum.

Here, we have found that maximum of the GTCS patients belonged to the age group of 11-20 years (63.64%). Most were female (54.55%), from a lower middle socioeconomic class (36.36%), 90.91% being illiterate, and most were from rural population (54.55%). The subjects with GTCS had come equally from nuclear and joint families.

Table 4B and Figure 5 shows distribution of the types of seizure disorder according to the types of ID. We can see that most of our subjects with GTCS (63.6%) had severe/profound ID, most cases with simple partial seizure (100%) belonged to the moderately intellectually disabled category, whereas most of the absence seizure (60%) belonged to the mild intellectually disabled group. Complex partial seizure and partial seizure with secondary generalisation can be found equally among the mild (50%) and moderate (50%) disability group.

On investigating about the types of seizure disorder and various socio-demographic variables, we have not found any significant association between them (Table 5A). However, we found that among the different types of seizure disorder, GTCS was more among the subjects with low IQ (p=0.001). Odds ratio here is significantly high, i.e. 55.86 (95% confidence interval [CI]: 2.532-1232). Also, the prevalence of GTCS increases with the increasing severity of ID (p-value =0.0042) (Table 5B).

Discussion

Our study is a hospital-based, cross-sectional study on serially taken 100 intellectually disabled subjects who fulfilled the DSM-5 criteria for ID as well as the other inclusion and exclusion criteria as mentioned earlier. We investigated about the prevalence and type of seizure disorders and their socio-demographic association among those subjects. In our study, we found that seizure disorder was present in 22% of

Table 2A: Prevalence of seizure disorder according to types of ID

Variable	Seizure disorder (%)		
	Present	Absent	Grand total
Mild	5 (11.9)	37 (88.1)	42 (100)
Moderate	8 (20)	32 (80)	40 (100)
Severe	8 (47.06)	9 (52.94)	17 (100)
Profound	1 (100)	0 (0)	1 (100)
Grand total	22 (22)	78 (78)	100 (100)

Chi-square was applied: χ^2=10.81, df=2, p-value=0.0045. ID=Intellectual disability, df=Degree of freedom

Table 2B: Prevalence of seizure disorder according to IQ score

Variable IQ	Seizure disorder (%)		
	Present	Absent	Grand total
1-35	8 (50)	8 (50)	16 (100)
36-70	14 (16.67)	70 (83.33)	84 (100)
Grand total	22 (22)	78 (78)	100 (100)

Fisher's exact t-test was applied: p-value=0.0067, Odds ratio=0.2, IQ=Intelligence quotient

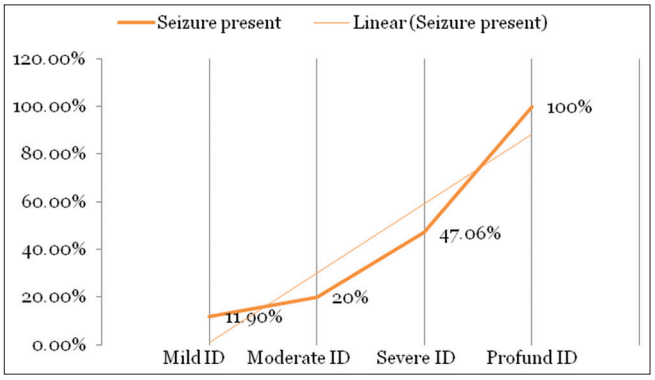

Figure 3: Line diagram showing increase in prevalence of seizure disorder with increase in severity of ID. ID=Intellectual disability.

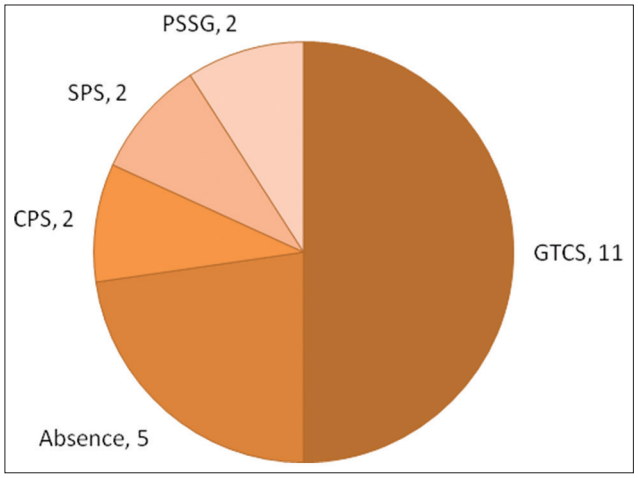

Figure 4: Distribution of the types of seizure disorder in intellectually disabled subjects. GTCS=Generalised tonic clonic seizure, CPS=Complex partial seizure, SPS=Simple partial seizure, PSSG=Partial seizure with secondary generalisation.

Table 3: Correlation of various important socio-demographic variables and seizure disorder in study subjects

Variables	Seizure disorder		p-value	Significance	Odds ratio	95% CI
	Absent	Present				
Age (years)						
<20	56	18	0.4193	Not significant	0.5657	0.1720-1.861
>20	22	4				
Sex						
Male	47	12	0.633	Not significant	0.7915	0.3048-2.055
Female	31	10				
Domicile						
Rural	41	11	1.000	Not significant	1.108	0.4299-2.856
Urban/semi-urban	37	11				
Type of family						
Nuclear	36	10	1.000	Not significant	1.023	0.3977-2.66
Joint/extended	42	12				
Education of subject						
Illiterate	40	19	0.0031	Significant	0.1662	0.04546-0.6077
Literate	38	3				
Education of father						
Illiterate	24	6	1.000	Not significant	1.185	0.4129-3.402
Literate	54	16				
Education of mother						
Illiterate	42	10	0.6297	Not significant	1.4	0.5413-3.621
Literate	36	12				
Socioeconomic status						
Lower+lower middle	60	16	0.7784	Not significant	1.25	0.4261-3.667
Middle+upper middle+upper	18	6				

CI=Confidence interval

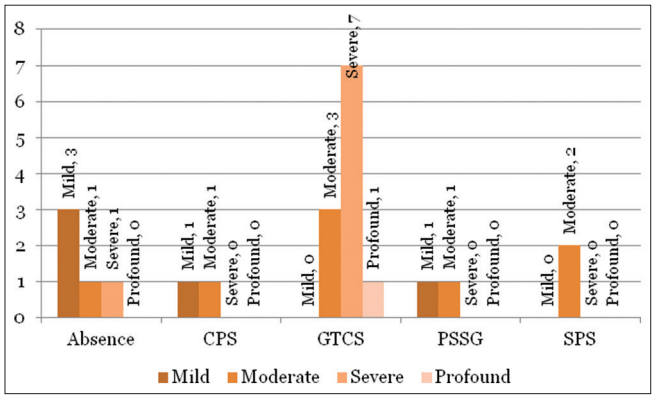

Figure 5: Distribution of types of seizure disorder according to types of ID. ID=Intellectual disability, CPS=Complex partial seizure, GTCS=Generalised tonic clonic seizure, PSSG=Partial seizure with secondary generalisation, SPS=Simple partial seizure.

the intellectually disabled subjects. As quoted by McGrother *et al.*[10], "community-based studies of epilepsy in adults with ID show a prevalence of 16-26%"; they also conducted a population-based prevalence study among the English population and found that the prevalence of epilepsy in adults with ID was 26%. As quoted by Deb[11], "epilepsy affects approximately 14 to 24% of patients who are mentally retarded". Among studies on adults who have mental retardation, Lund[12] found that in 18.2% of a Danish population, there was a history of epilepsy at some point in their life. When we searched for seizure disorder among individual types of ID, we found that 47.06% of severe intellectually disabled subjects, 20% of the moderately disabled, 11.9% of the mildly disabled subjects, and the only subject with profound disability had comorbid seizure disorder. So, here we see that the prevalence of seizure disorder increases with the increase in the severity of ID. This finding is highly significant statistically (p-value=0.0045). Madhavan and Narayan,[13] in their study, also found increased number of seizure disorder cases with the increase in the severity of the retardations. They found 9.6% of the mild, 11.8% of the moderate, 21.9% of the severe, and 33.8% of the profoundly mentally retarded subjects had comorbid seizure disorder. They also mentioned about the similar findings reported by Corbett[14] and Rutter *et al.*[15] which were quoted by O'Donohoe.[6] Steffenburg *et al.*[16] conducted a study among 378 children with mental retardation between age six and 13, and found that 15% of those with mild mental retardation and 45% of those with severe mental retardation had epilepsy. Johnson *et al.*[17] in their study quoted that Shepherd and Hosking[18] also

Table 4A: The socio-demographic data of the study subjects according to types of seizure disorder

Variables	Absence (%)	GTCS (%)	Others (CPS+SPS+PSSG) (%)	Total ID patients (%)
Age (years)				
1-10	3 (60)	2 (18.18)	2 (33.3)	7 (31.82)
11-20	1 (20)	7 (63.64)	3 (50)	11 (50)
21-30	0	0	1 (16.66)	1 (4.55)
31-40	0	1 (9.09)	0	1 (4.55)
41-50	0	1 (9.09)	0	1 (4.55)
51-60	1 (20)	0	0	1 (4.55)
Grand total	5 (100)	11 (100)	6 (100)	22 (100)
Sex				
Female	1 (20)	6 (54.55)	3 (50)	10 (45.45)
Male	4 (80)	5 (45.45)	3 (50)	12 (54.55)
Grand total	5 (100)	11 (100)	6 (100)	22 (100)
Socioeconomic status				
Lower	1 (20)	3 (27.27)	1 (16.66)	5 (22.73)
Lower middle	3 (60)	4 (36.36)	4 (66.66)	11 (50)
Middle	1 (20)	3 (27.27)	1 (16.66)	5 (22.73)
Upper middle	0	1 (9.09)	0	1 (4.55)
Upper	0	0	0	0
Grand total	5 (100)	11 (100)	6 (100)	22 (100)
Education of subject				
Illiterate	4 (80)	10 (90.91)	5 (83.33)	19 (86.36)
Primary	1 (20)	1 (9.09)	1 (16.66)	3 (13.64)
Grand total	5 (100)	11 (100)	6 (100)	22 (100)
Type of family				
Extended	0	1 (9.09)	0	1 (4.55)
Joint	3 (60)	5 (45.45)	3 (50)	11 (50)
Nuclear	2 (40)	5 (45.45)	3 (50)	10 (45.45)
Grand total	5 (100)	11 (100)	6 (100)	22 (100)
Domicile				
Rural	2 (40)	6 (54.55)	3 (50)	11 (50)
Semi-urban	1 (20)	3 (27.27)	1 (16.66)	5 (22.73)
Urban	2 (40)	2 (18.18)	2 (33.33)	6 (27.27)
Grand total	5 (100)	11 (100)	6 (100)	22 (100)

GTCS=Generalised tonic clonic seizure, CPS=Complex partial seizure, SPS=Simple partial seizure, PSSG=Partial seizure with secondary generalisation, ID=Intellectual disability

Table 4B: Distribution of types of seizure disorder according to types of ID

	Mild (%)	Moderate (%)	Severe (%)	Profound (%)	Grand total (%)
Absence	3 (60)	1 (20)	1 (20)	0	5 (100)
CPS	1 (50)	1 (50)	0	0	2 (100)
GTCS	0	3 (27.27)	7 (63.6)	1 (9.09)	11 (100)
PSSG	1 (50)	1 (50)	0	0	2 (100)
SPS	0	2 (100)	0	0	2 (100)
Grand total	5 (22.7)	8 (36.36)	8 (36.3)	1 (4.55)	22 (100)

ID=Intellectual disability, CPS=Complex partial seizure, GTCS=Generalised tonic clonic seizure, PSSG=Partial seizure with secondary generalisation, SPS=Simple partial seizure

reported similar trend. They found that seven per cent of children with mild mental retardation as opposed to 67% of those with severe mental retardation had epilepsy. There is a variance in the reported rates of epilepsy in people with profound mental retardation. Literatures suggest it varies between 50[19] and 82%.[20]

In our study, we found that the most common type of seizure disorder is GTCS (n=11), which is 50% of all the patients with seizure. Types of seizure found by Steffenburg *et al.*[16] in their study sample were tonic-clonic, myoclonic, atypical absences, and partial complex seizures. Among the children identified with seizure disorder (n=98), 60% (n=59) had generalised seizure and 20% (n=20) had partial seizure.

In our study, most of the subjects with GTCS (63.6%) had severe ID, most cases with simple partial seizure (100%) belonged to the moderately intellectually disabled category, whereas most of the absence seizure (60%) belonged to the mild intellectually disabled group. Complex partial seizure and partial seizure with secondary generalisation were equally distributed among the mild (60%) and moderate (60%) disability group. We also observed in our study that the association between GTCS and severity of ID was statistically significant (p-value=0.0042). We have also found a significant association between GTCS and low IQ (p=0.001). Odds ratio here is significantly high, i.e. 55.86 (95% CI: 2.532-1232).

In this context, we would like to highlight the fact that a study carried out in the same centre on 'organic mental disorders' found maximum number of cases to be of seizure disorder.[21] Chronic illnesses like epilepsy takes a toll not only of the patients but their caregivers as well. When such a condition is comorbid with mental illness, the problem increases manifold. Among persons with epilepsy and schizophrenia, Kumar *et al.*[22] studied subjective well-being and coping, while Karim *et al.*[23] studied care burden and social support of caregivers. Moreover, there is a therapeutic aspect to it also. Yadav *et al.*[24] "found prevalence of seizures and encephaliti was more common in rural and low socioeconomic status patients in all age groups. The patients with seizures in post encephalitis and sequelae were less tolerated to higher doses antiepileptic drugs and its combinations."

Table 5A: Association of various important socio-demographic variables and the types of seizure disorder in subjects

Variable	Type of seizure disorder (total subjects with seizure disorder=22) (%)		
	GTCS	Absence	Others
Age (years)			
<20	9 (40.9)	4 (18.18)	5 (22.7)
>20	2 (9.09)	1 (4.54)	1 (4.54)
Sex			
Male	5 (22.7)	4 (18.18)	3 (13.6)
Female	6 (27.2)	1 (4.54)	3 (13.6)
Domicile			
Rural	6 (27.2)	2 (9.09)	3 (13.6)
Urban/semi-urban	5 (22.7)	3 (13.6)	3 (13.6)
Type of family			
Nuclear	5 (22.7)	2 (9.09)	3 (13.6)
Joint+extended	6 (27.2)	3 (13.6)	3 (13.6)
Education of subject			
Illiterate	10 (45.4)	4 (18.1)	5 (22.7)
Literate	1 (4.54)	1 (4.54)	1 (4.54)
Socioeconomic status			
Lower+lower middle	7 (31.8)	4 (18.18)	5 (22.7)
Middle+upper middle+upper	4 (18.18)	1 (4.54)	1 (4.54)

GTCS=Generalised tonic clonic seizure; 'others' include simple partial seizure, complex partial seizure, and partial seizure with secondary generalisation

Conclusion

In our study, out of 100 intellectually disabled cases, we found that the prevalence of seizure disorder was 22%, which is supported by most of the national and international studies. Regarding the association between seizure disorder and various socio-demographic variables, we found that seizure was mostly found in the age group of 11-20 years (50%), probably indicating that they are diagnosed much later as compared to developed countries due to poor parental education, poor healthcare services, and many other related factors. There was no significant difference in various religious groups; however, seizure disorder was found to be more in the sample coming from rural areas, which probably reflected the real picture of the society. We did not find any significant differences in distribution of seizure disorder in family type; but, we have found that 86.36% of the seizure disorder subjects were illiterates and also seizure disorders were more in the group of illiterate mothers (45%), from lower middle class socioeconomic strata (50%), and those whose parents works as unskilled workers (40.91%). We have noticed a statistically significant correlation between severity of ID and frequency of seizure disorder; it was also distributed in the same way when correlated with the IQ of the sample. Though statistically we have only found statistical association of seizure disorder with illiteracy of the subjects, findings in relation to other socio-demographic variables were also important from the psychosocial point of view for management. Poor education, poor socioeconomic status, poor healthcare facilities, and poor awareness- all are important psychosocial variables which are strongly associated with ID and seizure disorder as well as their management. In the present study,

Table 5B: Association between GTCS and type of ID and IQ score

Variables	Seizure disorder (n=22) (%)		p-value (%)	OR	95% CI
IQ score	GTCS	Non-GTCS			
1-35	8 (72.7)	0	0.001	55.8	2.532-1232
36-70	3 (27.2)	11 (100)			
Total	11 (100)	11 (100)			
Mild+moderate ID	3 (27.2)	10 (90.9)	0.0075	0.0375	0.003245-0.4334
Severe+profound ID	8 (72.7)	1 (9.09)			
Total	11 (100)	11 (100)			

GTCS=Generalised tonic clonic seizure, ID=Intellectual disability, IQ=Intelligence quotient, OR=Odds ratio, CI=Confidence interval

we have found that 50% of the seizure disorders were GTCS in type, which indicates that this group should be treated and controlled as early as possible to prevent further deterioration. On investigating about the type of seizure disorders and various socio-demographic variables, we have not found any significant association; however, when the types of seizure disorder are compared with types of ID and IQ score, most of the GTCS cases (eight out of 11, 72.7%) were coming from severe/profound ID group and from an IQ range of one to 35.

Our study has got some limitations too. As it was a hospital-based study in a tertiary care centre, these findings may not portray the actual picture prevailing in the society. Also, we have taken only 100 subjects in our sample. If analysis is carried out on a larger sample, more light could be shed on the issue at hand. Our study, however, points towards a need for urgent interventions at psychosocial level to reduce the preventable causes of ID and seizure disorder for better outcome of already affected subjects in our society.

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