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Genesis of Psychopathogy in epileptics

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Abstract

Children suffering from epilepsy have been found to be strikingly susceptible to psychiatric disorders and almost all forms of such abnormalities have been reported in them. Except for a few, most studies on epilepsy concern adults.

Nearly half of the children from the subject group had at least some psychiatric disturbance. In comparison only one fourth of the children from the control group displayed any psychiatric disturbance. The most common psychiatric problem in the epileptic child was conduct disorder followed by a lowered intelligence, whereas in the non epileptic child anxiety and conduct disorder was common. Various factors were found to be significantly associated with psychopathology, these were either contributory to the epilepsy or were consequent to the epileptic state along with its biological, psychological and social ramifications.

Thus, psychopathology reflected a complex interaction of seizures, socio-demographic factors and treatment related variables, in accord with studies. Clinicians should be sensitive in identifying psychopathology since this may lead to effective interventions for this group of children.

Keywords: Family; Psychiatry; Psychopathology; epilepsy

Introduction

Individuals afflicted with epilepsy have suffered greatly from, the illness itself along with its psychological implications, and the outcome of this gets further amplified due to the perceptions of the family members, friends and society at large.

Children suffering from epilepsy have been found to be strikingly susceptible to psychiatric disorders and almost all forms of such abnormalities have been reported in them. Except for a few, most studies on epilepsy concern adults' (7)

A psychiatrist often attends to the problem of epilepsy in children, as well as the behavioural problems or temperamental changes associated with it. Since epilepsy is perceived as a key problem, parents sometimes tend to handle the child differently than other siblings in the form of overprotection etc' (15) Deriving insight from these facts an attempt has been made to study the probable factors which play a significant role in bringing about the psychiatric morbidity in children suffering from epilepsy.

Aims and Objectives: To study the probable contributory factors in the genesis of psychopathology in epileptic children.

Materials and Methods

The study was conducted in a tertiary care, teaching hospital in Navi-Mumbai. 50 consecutive children in the age range of 4-14 years attending paediatric epilepsy clinic in a general hospital were selected for the study. 50 healthy children matched for age, sex and socio-economic strata with no acute illness at the time of interview constituted the control group.

Informed consent was taken for the study from the parents and appropriate scales were administered to meet the above mentioned objectives. Parent of each child were explained about the nature of the study. Confidentiality about the identity and data gathered was assured.

1. 50 consecutive children suffering from epilepsy, in the age range of 4-14 years and whose parents are willing to give consent to participate in the study.
2. Children with minimum duration of illness for more than 1 year.
3. E.E.G suggestive of seizure disorder in the past one year.

Instruments used:

1. Detailed Performa was prepared to gather information from the parent to clinically evaluate and collect the required data of each child.

2. CPMS – Childhood Psychopathology Measurement Schedule.

3. PHQ – Parental Handling Questionnaire.

4. TMS – Temperament Measurement Schedule.

50 consecutive children in the age range of 4-14 years attending the paediatric epilepsy clinic and who were on antiepileptic medications were selected along with 50 normal children attending general paediatric OPD; these constituted the study and the control group respectively.

After taking the informed consent the samples were assessed on the basis of the information gathered through the Performa. The Child and his/her parent were individually interviewed.

Each child and their parents were assessed on the above mentioned scales. Each child was subjected to routine IQ testing as well.

Childhood Psychopathology Measurement Schedule

The detailed procedural adaptation and standardization of the Child behaviour checklist (CBCL) to the Indian situation was done by *Malhotra et al.* in 1988. However this checklist had it's own limitations when applied to an Indian setting, especially when it came to measuring the social competency, and moreover because of it's greater emphasis in the assessment of psychopathology rather the total evaluation of the competencies or the impairments, hence in our study we preferred the use of CPMS instead. (37)

Childhood Psychopathology Measurement Scale or the CPMS, in it's final form, is a bilingual scale, both in Hindi and English. It comprises 75 items with response rated as 'yes' (0) or 'no' (score 1); this can be administered as an interview schedule or as a self-administered questionnaire; CPMS also serves as a useful guide to clinical interviewing. It is applicable to 4-14 years old children of both the sexes. Taking the cut-off score of 10 and above, CPMS can be used as a screening instrument in epidemiological studies as well. Total, and also specific factor scores can be used to quantify or categorize psychopathology, as also as to monitor the change in clinical condition during medical intervention. Assessment can be done on the basis of the information which is obtained as per the symptoms listed in CPMS, and whether they were present during the past one month, six months, any time or during the most part of a child's illness. The informant should be a parent, preferably mother or a parent surrogate. (40)

The advantage of CPMS over CBCL include ease of administration; simplicity of scoring; applicability to a wide age range and local cultural context; availability of local norms; wider application such as, it's use for the screening purpose; quantification of psychopathology and measurement of the clinical progress. The CPMS has been extensively used in studies in India, and with satisfactory results.

Results and Discussions

Diagnostic distribution according to CPMS:

	SUBJECT n.	%
Low intelligence	16	32
Conduct Disorder	20	40
Anxiety	8	16
Depression	3	6
Psychotic symptom	1	2
Special Symptoms	1	2
Physical Illness with Emotional Problems	6	12
Somatization	7	14

Majority of children in the subject group had low intelligence with behavioural problems (32%) and/or conduct disorder (40%) whereas psychotic symptoms were not common (2%). Shukla and Katiyar (40, 44) noted that behavior disorder was the commonest diagnosis in their study group.Lennox (26) found mental inadequacy to be the commonest diagnosis in epileptics. Anxiety and conduct disorder (20% and 16%) respectively were common in children in the control group.

It may be noted that the figures shown in CPMS are overlapping, this is indicative of the fact that one child can suffer multiple psychopathologies. Hence it may be concluded that a *low intelligence with behavioural problems* and problems of *conduct disorder* is

common association to epilepsy as an illness in an childhood.

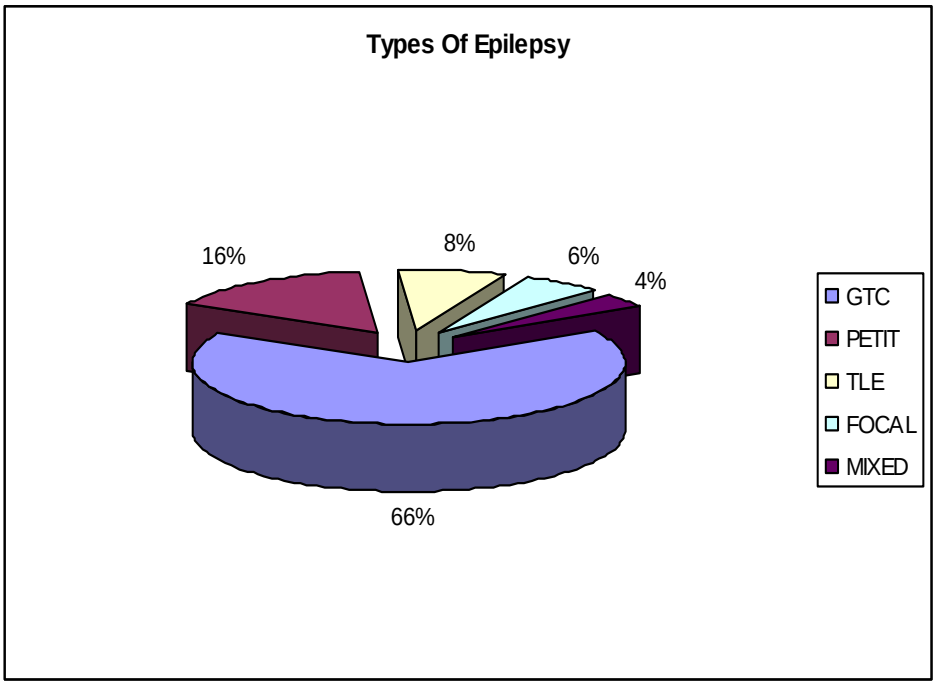
A bio-psycho-social model of explanation can be proffered here; Hypoxic brain damage as a consequence of repeated seizure episodes may explain both low intelligence and conduct disorder.

Psychologically these children were low on self esteem and perceived their illness as a setback which denied them the pleasures of a normal childhood, also due to overprotection emanating from the parents, there was a compromised scholastic contact and hence a delay in acquiring intellectual assets.

Neighbours and friends often perceived these children as weak and desirous of sympathy, and often their peers disallowed them to be a part of their play group, at times these children were ostracized as well in social settings. Parents also at times condoned the undesired behaviour of these children; hence their superego was challenged leading to problems of conduct disorder. Hence social factors also played a demonstrable role in explaining lowered intelligence with behavioural problems and conduct disorder which were significantly prevalent in this study.

Type of Epilepsy:

	SUBJECT n.	%
GTC	33	66
PETIT	8	16
TLE	4	8
FOCAL	3	6
MIXED	2	4
TOTAL	50	100



In the subject group, the commonest epilepsy type was generalized tonic-clonic seizure (66%) and the least common was the mixed type of epilepsy (4%).

Type of Epilepsy and Psychopathology:

	CPMS <10 n.	%
GTC	18	54.5
PETIT	2	25
TLE	4	100
FOCAL	3	100
MIXED	1	50
TOTAL	28	56

These children were screened using CPMS scale, 28(56%) out of the 50 patients studied a score below the cut off of, <10 was noted; whereas 22(44%) scored >10 on the CPMS scale. Amongst the 22(44%) whose score was above 10, 68.2% suffered from generalized tonic-clonic type of epilepsy, 27.3% were had petit mal epilepsy and 4.5% the mixed type. Children with Temporal lobe epilepsy and Focal type of epilepsy did not have any significant psychiatric morbidity. Upon application of Chi-square Test the difference between the CPMS score and types of epilepsy in subject group was found to be statistically not significant p value >0.05.

Although earlier studies carried by Stores (44) shows that Temporal lobe epilepsy is associated with psychological disabilities, especially when the pathology is left sided, our study could not replicate those findings.

Proximity to the limbic system and at times because of the limbic involvement itself in individuals with Temporal lobe epilepsy is a plausible explanation for the emotional and behavioural problems and this reason has been derived as much from earlier studies, however in our study it may be speculated that the focal nature of the epileptic involvement was not to an extent that a limbic reach took place at all, and hence the patients in this study were spared the emotional and behavioural implications of the Temporal lobe epilepsy. Also focal seizure implies a focal cerebral involvement as compared to a more generalized disturbance of cerebral neuronal activity which occurs in a generalized seizure state.

Also it is worthwhile to remark that our sample size itself was rather small to draw a substantial comparison.

AGE YEARS			
grp	Mean	N	Std. Deviation
SUBJECT	9.60	50	2.935
CONTROL	9.58	50	2.963
Total	9.59	100	2.934

Socio-Demographic characteristics and CPMS:

	SUBJECT n.		
	<10	>10	TOTAL n=50
AGE **4-6** **7-9** **10-14**	3(37.5) 9(75) 16(53.3)	5(62.5) 3(25) 14(46.7)	8(16) 12(24) 30(60)
SEX **MALE** **FEMALE**	17(58.6) 11(52.4)	12(41.4) 10(47.6)	29(56) 21(44)
SOCIO-ECONOMIC CLASS : **LOWER** **MIDDLE** **UPPER**	15(52) 10(62.5) 3(60)	14(48) 6(37.5) 2(40)	29(58) 16(31) 5(9)
RELIGION : **HINDU** **MUSLIM** **CHRISTIAN** **OTHER**	17(53.1) 9(69.2) 0(0) 2(66.7)	15(46.9) 4(30.8) 2(100) 1(33.3)	32(64) 13(26) 2(4) 3(6)
LOCALITY **URBAN** **RURAL**	18(54.5) 10(58.8)	15(45.5) 7(41.2)	33(66) 17(34)
LATERALITY **Right** **Left** **Ambidexrous**	23(63.9) 4(36.4) 1(33.3)	13(36.1) 7(63.6) 2(66.7)	36(72) 11(22) 3(6)

Socio-Demographic findings in relation to the Psychopathology

Sex:

Twelve of the 29 males and ten of the 21 females in the subject group had CPMS score >10. Statistically there was no significant difference in psychiatric morbidity in the subject group as far as the child's sex was concerned. In control group it was noted that there is a greater prevalence of psychiatric morbidity in boys (34.4%) as compared to girls (5.6%) ; 'p value' is <0.05 which is statistically significant. Stores (44), observes a greater prevalence of psychological problems in boys.

Age:

In our study a majority of children in both the groups were between 10-14 years of age.The

mean age in subject group was 9.6 years, as compared to the control group and was 9.58 years. Nearly 50% of children in the age group of 4-6 as well as those in the age group of 10-14 years had high prevalence of psychiatric morbidity; this finding was however statistically insignificant as 'p value' was >0.05.

Socio-economic status:

Majority of the children in both subject and the control group belonged to lower socio-economic class. From the subject group, 14 out of 29 children (48%) from lower socio-economic class had high prevalence of psychiatric morbidity, while in control group the prevalence of psychiatric morbidity among the lower and the middle socio-economic class was nearly 40% respectively. Upon the application of "Chi-square" the difference between the CPMS score and Socio-economic class of the subject and the control group was found to be statistically not significant, 'p value' <0.05

Religion:

In both the subject and the control group, a majority (60%) were of Hindu religion. Amongst the subject group, children belonging to Hindu religion had high psychiatric morbidity (46.9%) followed by those from the Muslim community (30.8%). Whereas, in the control group, children belonging to the Muslim community, had higher psychiatric morbidity (50%), followed by those from the Hindu religion (10.3%). Upon application of chi-square the difference between CPMS score and religion in the subject group and the control group was found to be statistically significant p value <0.037*.

It may be explained that the psychiatric morbidity in the Muslim population of the control group was higher perhaps because of a larger family size, and hence a divided parental attention when it came to tending to the children's need, both financially and emotionally.

Handedness:

In both the subject and the control group, a majority (75%) were Right handed. Prevalence of psychiatric morbidity in subject group was higher in the Right handed. Two of the three ambidextrous children in the subject group had CPMS score more than 10. Upon application of 'Chi-square' the difference between CPMS score and laterality in the subject and the control group was found to be statistically not significant 'p value' >0.05.

In literatures it has been proposed that, when laterality is not developed the child may be at a higher risk of developing psychiatric morbidity. Laterality develops by the age of 7 years and all the ambidextrous children in our study group were above 7 years of age, by which time, laterality is expected to have developed.

Coordination between age of onset, duration of epilepsy and duration of attacks:

	Total Duration of Epilepsy Yrs.	Age of Onset Yrs.	Duration of Attacks Min.
SUBJECT MEAN	2.63	7.24	4.76
Std. Deviation	1.481	2.646	3.761

The age of onset of epilepsy:

In this study, the minimum age of onset of epilepsy is 3 years and maximum is 12 years. The mean age of onset of epilepsy is 7.24 years. Lennox and Lennox (26) in their study found that early age of onset of epilepsy carried a poorer prognosis for mental functioning.

According to Goldin and Margolin, age has been found to be a major variable related to psychosocial functioning. The earlier the age which epilepsy occur the greater was the tendency to develop psychosocial problems.

The total duration of epilepsy:

In our study the minimum duration of epilepsy is one year and the maximum being 6 years. The mean duration of epilepsy is 2.63 years. Those children in the subject group who had total duration of illness for two or more years scored high on CPMS.Slater and Beard (42) in their study found that duration of epilepsy was an important etiological variable in the development of psychopathology.

Frequency of Attacks, Response and compliance to Treatment:

Subject.	CPMS<10 n.	%
Frequency of attacks		
High	15	55.6
Low	13	58
Response to Treatment		
Good	19	66.9
Fair	7	53.8
Poor	2	22.2
Compliance to Treatment		
Good	26	68.4
Poor	2	16.7

The development of psychopathology is significantly determined by the frequency of attacks, the response to treatment and also the compliance factor. Twenty seven out of fifty children in the subject group had a high frequency of attacks (more than 1 epileptic episode in a month). Of these 44.4% had a score of more than 10 on CPMS, which was diagnostically significant.

Nine out of the 50 patients responded poorly to treatment, of which 77.8% had psychopathology on CPMS. After the application of 'Chi-square', the difference between CPMS score and the response to treatment, in the subject group, was found to be statistically significant ('p value' <0.05*).

Nearly one third of the children in the subject group had poor compliance to treatment, of these 83.3% had high scores on CPMS. Upon application of the 'Chi-square Test' the difference between, CPMS score and poor compliance to treatment in the subject group was found to be statistically significant (p value <0.05*).

Therapeutic response and compliance to the treatment seem to be closely related. In this study there were several factors identified which could influence these variables, including misconceptions about an epileptic illness, awareness of the nature of the illness amongst the family members, frequent discontinuation of medications based on religious believes including their reliance upon faith healers, ignorance regarding the importance of treatment and failure to understand the treatment regime, and the discontinuance of treatment because of financial constraints.

All these factors were interdependent since irregular follow up, leads to an increased frequency of attacks which could in turn be a significant reason for the poor response to treatment. Also it may be true that poor compliance could be due to the poor response to the treatment.

In their study Slater and Beard did not conclude that the frequency of epilepsy has any bearing in the genesis of psychosis.

Etiologic and Precipitating factors: Emotional stress appeared to be an important factor which precipitated seizure episodes in the subject group of our study.

Sub.	CPMS<10 n.	%
Etiologic Factors		
Genetic	4	57.1
Head Injury	0	0
Febrile	6	46.2
Precipitating Factors		
Hyperventilation	3	33.3
Photic	2	100
Emotional stress	4	36.4

Family History:

	SUBJECT n=50			
	<10		>10	
	n.	%	n.	%
Type of Family				
Nuclear	17	50	17	50
Joint	8	61.5	5	38.5
Single Parent	3	100	0	0
No. of Sibling				
Only child	4	50	4	50
<3	15	48.4	16	51.6
>3	9	81.8	2	18.2
Consanguinity				
Yes	6	54.5	5	45.5
No	22	56.4	17	43.6
Family H/O Epilepsy Yes	4	50	4	50
No	24	57.1	18	42.9
Family H/O Mental Illness				
Yes	8	66.7	4	33.3
No	20	52.6	18	47.4

The type of family and number of siblings statistically did not significantly correlate with development of psychopathology in our study. Gortmaker et. al. and Vining have suggested that single parent family and also many siblings in the family, may lead to psychosocial problem in children with chronic illnesses.n50% children in the subject group of our study who had family history of epilepsy developed psychological disturbance, this was statistically significant.

In our study, the contribution of the family history of mental illness in the subject, as well as the control group was not statistically significant in the development of psychopathology. This may suggest that psychiatric morbidity in children with epilepsy is unlikely to be genetically related.

Brain damage and delayed milestones: Scholastic Performance:

	SUBJECT	
	<10 n	>10 n
H/O Brain damage		
Yes	4	14
No	24	8
H/O Delayed Milestones		
Yes	5	7
NO	23	15

	SUBJECT				
	<10		>10		
	n.	%	n.	%	TOTAL
Scholastic Backwardness					
Yes	15	53.6	13	46.4	28(56)
No	13	59.1	9	40.9	22(44)
H/O Change of School					
Yes	7	63.6	4	36.4	11(22)
No	21	53.8	18	46.2	39(78)
Extracurricular Activities					
Yes	9	64.3	5	35.7	14(28)
No	19	52.8	17	47.2	36(72)

Brain damage and delayed developmental milestones:

Brain damage in the past has very strong correlation with development of psychiatric disturbances, in epileptic children.Various authors including Ruther et. al have mentioned similar findings.

One of the important causes of brain damage in epileptics is cerebral hypoxia which occurs each time there is a seizure episode and this brain damage is irreversible, which explains the developmental milestone delays. Amongst the twelve children with history of delayed milestone, seven of them had psychological disturbance, this finding was statistically significant.

Scholastic backwardness:

Amongst 56% children from the subject group who had Scholastic backwardness, nearly 50% of them had significantly demonstrable psychopathology, whereas in control group only 8% had scholastic backwardness of which only half had developed psychological disturbance. Upon application of 'Chi-square', the difference between the CPMS score and scholastic backwardness in subject and control group was found to be statistically significant, (p value <0.05).

It may be argued that these children generally are low on self-esteem and perceived that their illness thwarted their aspirations and desires; also the parental care of these patients was such, that it smothered the child with overprotection, compromising at times upon the educational needs, thus overall stifling scholastic growth.

Extracurricular activity:

Almost Two third (72%), children from the subject group had no extracurricular activities, in comparison to only 26% children from control group. Upon application of 'Chi-square Test' the difference between the CPMS score an the extracurricular activities in subject and control group was found to be statistically significant, p value <0.05*.

These children were often looked upon with sympathy from neighbours and friends thus amplifying the individual's sense of weakness and a lowered self esteem; as also being ostracized in certain social settings kept the child away from extracurricular activities. And if at all there was intent to partake in extracurricular activities, their peers often disallowed them to be a part of their social and play activity. Hence it may be surmised that psycho-social factors, apart from the biology of the seizure itself affected the child's participation in extracurricular activity and also led to other demonstrable psychopathologies and scholastic backwardness.

Change of school:

A history of change of school was not found statistically significant in the development of psychopathology in both the subject and the control group. Stores(44) mentions that the social isolation of epileptic children, can lead to emotional problems.

Intelligence:

	SUBJECT
>90	20(40)
79-90	17(34)
55-70	9(18)
35-55	3(6)
20-35	1(2)
Total	50(100)

Intelligence Quotient and CPMS:

IQ	SUBJECT			
	<10		>10	
	n.	%	n.	%
>90	12	60	8	40
70-90	12	70.6	5	29.4
55-70	3	33.3	6	66.7
35-55	1	33.3	2	66.7
20-55	0	0	1	100

Intelligence quotient:

Thirty children in the subject group had a low Intelligence Quotient; out of these, 34% had borderline intellectual functioning and 2% had severe mental retardation. Whereas, in the control group, 82% children had normal intellectual functioning. This implies that children having epilepsy are at higher risk of having a low intellectual functioning. Lennox found that the most frequent mental disturbance associated with epilepsy was intellectual inadequacy.

Upon application of 'Chi-square Test' the difference between the CPMS score and the Intelligence Quotient in the subject and the control group was found to be statistically significant (p value <0.05).

Parental Handling Questionnaire:

	SUBJECT	
	Mean	S.D.
Care	10.04	2.515
Control	3.50	1.233

Parental handling questionnaire:

Parents in the subject group had relatively high control over their child and less care in contrast to the control group. Upon application of 'T-Test', the difference between the statistical mean for the care variable was found to be significant, whereas for the control group it was not significant statistically.

This finding suggests that in epileptic children with psychopathology, parental care is poor which may be either a cause or an effect of the psychiatric disturbance.

Conclusion

1. The development of psychopathology is significantly determined by the frequency of attacks. More than half of the children with epilepsy had more than 1 epileptic episode in a month. Of these 44.4% had significant psychopathology.
2. Out of the 50 patients suffering with epilepsy, 9 responded poorly to treatment. Of these 77.8% had significant psychopathology.
3. Nearly one third of the children, who suffered epilepsy, were poorly compliant to treatment. Of these 83.3% had psychopathology.
4. Emotional stress appeared to be an important precipitating factor for the seizure episodes.
5. In this study, the family type, whether single parent family, nuclear or joint, did not significantly correlate with development of psychopathology. Also the number of siblings did not determine the presence of psychopathology significantly.
6. Eight epileptic children who also had family history of epilepsy 50% of them developed significant psychiatric disturbance.
7. Out of the 50 children with epilepsy, twelve children had history of delayed milestone. Nearly 60% of these had significant psychiatric disturbance.
8. Twenty three of the fifty epileptic children had scholastic backwardness. Nearly 50% of these had significant psychopathology. Whereas only two of the four normal children who had scholastic backwardness developed psychological disturbance.
9. Almost two third children who suffered the epileptic illness did not participate in any extracurricular activity. In comparison a little more than one fourth of the normal children participated actively in them.
10. Nearly 60% of the epileptic children had low Intelligence Quotient (34% - borderline intellectual functioning and 2% - severe mental retardation.) On the other hand, majority of the normal children of our study (82%) had normal intelligence.
11. The parents of the children with epilepsy were relatively more controlling of the child's physical activity and exuding less of care, in contrast to the parents of the non-epileptic children.

Limitation of the Study and Its Utilityand Scope

1. Sample size: By virtue of it being rather small, it may be argued that the sample was not in its entirety representative of some of the results gathered, however it does focus upon the scope for further studies, which

2. may be done using a larger sample size.
3. Psychological disturbances were studied as a variable in itself, and it would have been desirable to study its subsets, it terms of definable discreet entities; this limitation itself may be considered as a scope for further studies.
4. Single point interview technique: Although a reliable longitudinal history could be gathered through the clinical interview and assessment, a longitudinal study based on follow-up evaluations as well may come a long way in contributing to the substantiality of this study.
5. Early identification and management of the associated factors, biological, psychological and social may be of great importance in determining the outcome of an epileptic illness in children in terms of the treatment modalities and the care taker education. This in our analysis is the major utility of this study.

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