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Original Article

Psychiatry/Mental Health Section

A Cross-sectional Study to Determine the Factors Affecting the Quality of Life in Patients with Grand Mal Epilepsy

JAGRITI YADAV[1], PRITI SINGH[2], SUREKHA DABLA[3], RAJIV GUPTA[4]

ABSTRACT

Introduction: Epilepsy is a chronic neurological condition that affects various domains of life apart from causing physical dysfunction. It is associated with various cognitive and psycho-social complications that can adversely affect the Quality of Life (QoL).

Aim: To study the socio-demographic and clinical factors affecting QoL in Patients With Epilepsy (PWE).

Materials and Methods: This cross-sectional study was conducted at a tertiary care centre in northern India on patients with Grand Mal Epilepsy. Total 60 PWE were assessed for psychiatric co-morbidity using Mini International Neuropsychiatric Interview version 6.0 and were divided into two groups, Group I and Group II, based on absence and presence of psychiatric co-morbidity, respectively. Self-administered QoL in Epilepsy-31 Scale was then used in both the groups to assess QoL in the study subjects and statistical analysis was done. Normally, distributed quantitative data was analysed using independent t-test for two groups and Analysis of Variance (ANOVA) test for three or more groups.

Results: The mean age of the study population was 27.68±9.51 years. A 55% of the study population were males and 45% of total study population were females. The mean total duration of epilepsy was 7.42±6.98 years. There was significant main effect due to socio-economic status for domains of emotional well-being (F=7.513, p=0.010), energy/fatigue (F=5.625, p=0.021), cognitive functions (F=7.708, p=0.007) and overall score (F=6.876, p=0.011) on QOLIE-31 scale. There was a significant main effect due to total duration of seizure disorder for domains of energy/fatigue (F=2.724, p=0.03) and cognitive functions (F=2.852, p=0.03). The mean scores of PWE with psychiatric co-morbidity were lower than PWE without psychiatric co-morbidity in all the domains of QoL in epilepsy scale and the differences in two groups were statistically significant (p=0.01).

Conclusion: The present study showed that QoL in PWE is associated with various socio-demographic and clinical factors beyond seizure control.

Keywords: Biopsychosocial model, Neuropsychiatric interface, Psychiatric disorders

INTRODUCTION

Epilepsy is a multifaceted disorder with neurological dysfunction and psychosocial complications. India has a prevalence rate of around 5.59 per 1000 population [1]. A study in collaboration with World Health Organisation (WHO) was conducted to assess treatment gap in PWE in India and it was found that only 20 out of 318 PWE consulted a qualified medical practitioner and 283 consulted faith healer [2].

In low and middle income countries mental health disorders are second leading cause of disease burden in terms of years lived with disability [3]. Apprehensiveness, fear, unequal job opportunities, social dissatisfaction, marital issues etc., contribute to psychosocial distress in PWE thus predisposing them to risk of developing psychiatric co-morbidity. The prevalence of life time depression in PWE is around 20% [4]. In a meta-analysis of 35 studies the point prevalence of major depressive disorder was 21.9% in PWE with higher prevalence in females (26.4%) than in males (16.7%) [5]. The prevalence of anxiety in PWE was around 15-20% while psychosis has an estimated prevalence of 5.6% [6]. Suicide is a leading cause of premature mortality in PWE and is five times more as compared to general population [7]. There is bidirectional relationship between suicide attempts and development of epilepsy which can be explained by some common underlying pathology [8].

Among five common neurological conditions (epilepsy, migraine, stroke, multiple sclerosis and Parkinson's disease) depression and anxiety has maximum impact on mental health component scores in epilepsy when assessed for Health Related Quality of Life (HRQoL) [9]. Stigma also remains strongly associated with epilepsy and is negatively correlated with QoL [10]. Various studies have been done to assess psychiatric co-morbidity in PWE with most of them taking into account only the mood disorders. Studies with more detailed evaluation of psychiatric co-morbidity and its correlation with QoL in PWE are still sparse [11,12] especially from middle income countries. There is also scarcity of literature assessing independent effect of psychiatric co-morbidity on QoL in PWE. In best of our knowledge, no previous study has been conducted on Indian population minimising the epilepsy related confounding factors namely type and control of epilepsy. In this study, the epilepsy related confounding factors (type and control of epilepsy) have been minimised Thus, the study aimed to assess QoL in PWE and to compare QoL in PWE with and without psychiatric co-morbidity, in order ascertain the importance of comprehensive management of epilepsy.

MATERIALS AND METHODS

A cross-sectional study was conducted in Psychiatry and Neurology Department at Pt. BD Sharma PGIMS, Rohtak, Haryana, India, over a period of one year from February 2019 till January 2020. The ethical clearance was sought from the Institutional Ethics Committee of Pt. BD Sharma PGIMS, Rohtak (vide letter no. IEC/18/psy04).

Inclusion criteria: The study enrolled patients who were diagnosed with epilepsy and already registered with the institute at least from last one year and purposive sampling was done. All the participants were more than 18 years of age, were on stable doses of anti-epileptic drugs and seizure free for last one month.

Exclusion criteria: The patients with presence of any chronic medical illness, mental and behavioural disorders due to substance, mental retardation, and speech or hearing disability were excluded from the study.

Sixty patients (purposive sampling) with grand mal epilepsy who consented for the study were divided into two groups. Group I consisted of 30 PWE without psychiatric co-morbidity and group II was consisted of 30 PWE with psychiatric co-morbidity.

Study Procedure

The diagnosis of grand mal epilepsy was confirmed by the Neurology consultant (author SD) based on clinical presentation. A written informed consent was obtained from the study participants. The PWE were assessed for psychiatric co-morbidity using Mini International Neuropsychiatric Interview Version 6.0 and were divided into the two groups based on absence or presence of psychiatric co-morbidity [13]. The patients in two groups were comparable in the type of epilepsy and adherence to the treatment from last one month. Self-administered QoL in Epilepsy-31 scale was then used in both the groups to assess QoL in the study subjects [14]. It is shorter version of QOLIE-89 inventory and its hindi translated version was used for the ease of study subjects [15]. An overall score was obtained using weighted average of multi item scale scores.

STATISTICAL ANALYSIS

The statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 16.0. The quantitative data was represented as mean and Standard Deviation (SD). Normally distributed quantitative data was analysed using independent t-test for two groups and ANOVA test for three or more groups. Point of statistical significance was taken when p-value <0.05.

RESULTS

The socio-demographic, socio-economic status (according to Kuppuswamy scale) and clinical profile of the study groups are summarised in [Table/Fig-1] [16]. The majority of the study population resided in rural area (70%) and belonged to joint family (65%). The mean age of the study population was 27.68±9.51 years. The mean age of onset of seizures in the study population was 20.73±8.71 years. Mean total duration of epilepsy was 7.42±6.98 years. Among all the patients 63.33% were on monotherapy and 36.67% were on polytherapy. Among the patients with psychiatric co-morbidity, majority had major depressive disorder (n=13) followed by generalised anxiety disorder (n=6), panic disorder (n=4) and social phobia (n=3).

Characteristics		Group I n (%)	Group II n (%)
Age range (years)	18-25	14 (46.67)	16 (53.33)
	26-34	9 (30)	10 (33.33)
	35-44	4 (13.33)	3 (10)
	≥45	3 (10)	1 (3.33)
	Mean±SD	27.68±9.51	
Sex	Male	17 (56.67)	16 (53.33)
	Female	13 (43.33)	14 (46.67)
Marital status	Unmarried	14 (46.67)	13 (43.33)
	Married	16 (53.33)	17 (56.67)
Education	Illiterate	1 (3.33)	2 (6.67)
	Primary education	3 (10)	5 (16.67)
	Secondary education	19 (63.34)	19 (63.34)
	Graduation	6 (20)	4 (13.33)
	Postgraduation	1 (3.33)	-
Employment status	Unemployed	5 (16.66)	6 (20)
	Full time employed	3 (10)	3 (10)
	Part time employed	8 (26.67)	9 (30)
	Student	6 (20)	4 (13.33)
	Homemaker	8 (26.67)	8 (26.67)
Socio-economic status*	Lower	17 (56.67)	20 (66.67)
	Middle	13 (43.33)	10 (33.33)
Age at onset of epilepsy(years)	5-10	2 (6.67)	3 (10)
	11-15	6 (20)	7 (23.33)
	16-20	13 (43.33)	10 (33.33)
	21-25	2 (6.67)	3 (10)
	>25	7 (23.33)	7 (23.33)
	Mean±SD	20.73±8.71	
Total duration of epilepsy (years)	1-5	14 (46.67)	13 (43.33)
	6-10	11 (36.67)	11 (36.67)
	11-15	3 (10)	4 (13.33)
	16-20	1 (3.33)	2 (6.67)
	>20	1 (3.33)	-
	Mean±SD	7.42±6.98	
Treatment	Monotherapy	18 (60)	20 (66.67)
	Polytherapy	12 (40)	10 (33.33)
Family history	Negative	18 (60)	12 (40)
	Positive	12 (40)	18 (60)

[Table/Fig-1]: Socio-economic, demographic and clinical profile of study groups. *Modified Kuppuswamy's socio-economic scale: updated income criteria, 2012 [16].

F-ratio could not attain the level of significance for age (p>0.05). There was no statistically significant difference in the any domain score among different age groups [Table/Fig-2].

Variable	Source of variance	Sum of squares	Df	Mean square variance	F ratio	p-value
Seizure worry	Between groups	2665.32	3	888.443	1.540	0.214
	Within groups	32312.24	56	577.004		
	Total	34977.57	59			
Emotional well being	Between groups	1001.51	3	333.837	0.352	0.788
	Within groups	53109.42	56	948.383		
	Total	54110.93	59			
Energy/ fatigue	Between groups	1005.65	3	335.217	0.511	0.676
	Within groups	36748.93	56	656.23		
	Total	37754.58	59			
Cognitive	Between groups	989.00	3	329.669	0.716	0.546
	Within groups	25769.28	56	460.166		
	Total	26758.29	59			
Medication effects	Between groups	4436.90	3	1478.96	2.54	0.065
	Within groups	32592.60	56	582.01		
	Total	37029.51	59			
Social functioning	Between groups	605.23	3	201.74	0.311	0.818
	Within groups	36373.29	56	649.52		
	Total	36978.53	59			
Overall QoL	Between groups	603.73	3	201.74	0.430	0.732
	Within groups	26218.60	56	649.52		
	Total	26822.34	59			
Overall score	Between groups	72.61	3	24.20	0.056	0.982
	Within groups	24212.49	56	432.36		
	Total	24285.10	59			

[Table/Fig-2]: Comparative analysis of scores of domains of QOLIE-31 scale between age groups of the study population using one-way ANOVA.

Score on all the domains varied due to socio-economic status. ANOVA showed a significant main effect of socio-economic status for emotional well-being (F=7.513, p=0.010), energy/fatigue (F=5.625, p=0.021), cognitive functions (F=7.708, p=0.007) and overall score (F=6.876, p=0.011) [Table/Fig-3].

There was no statistically significant difference in any domain score among different age of onset categories (p>0.05) [Table/Fig-4]. Score on all the domains varied due to total duration of epilepsy. ANOVA showed a significant main effect of total duration of illness for

Variable	Source of variance	Sum of squares	Df	Mean square variance	F ratio	p-value
Seizure worry	Between groups	1976.02	1	1976.02	3.473	0.067
	Within groups	33001.54	58	568.992		
	Total	34977.57	59			
Emotional well being	Between groups	5940.40	1	5940.40	7.5130	0.010
	Within groups	48170.52	58	830.52		
	Total	54110.93	59			
Energy/fatigue	Between groups	3337.89	1	3337.897	5.625	0.021
	Within groups	34416.68	58	593.39		
	Total	37754.58	59			
Cognitive	Between groups	3139.09	1	3139.09	7.7080	0.007
	Within groups	23619.20	58	407.228		
	Total	26758.29	59			
Medication effects	Between groups	10.70	1	10.70	0.017	0.897
	Within groups	37018.80	58	638.255		
	Total	37029.51	59			
Social functioning	Between groups	1232.89	1	1232.89	2.000	0.163
	Within groups	35745.63	58	616.30		
	Total	36978.53	59			
Overall QoL	Between groups	689.39	1	689.39	1.530	0.221
	Within groups	26132.94	58	450.56		
	Total	26822.34	59			
Overall score	Between groups	2573.99	1	2573.99	6.876	0.011
	Within groups	21711.10	58	374.32		
	Total	24285.10	59			

[Table/Fig-3]: Comparative analysis of scores of domains of QOLIE-31 scale among different socio-economic status of the study population using one-way ANOVA.

energy/fatigue (F=2.724, p=0.03) and cognitive functions (F=2.852, p=0.03) [Table/Fig-5].

The score on each domain was lower in PWE with psychiatric co-morbidity and the differences in two groups were statistically significant (p<0.05) [Table/Fig-6]. F ratio revealed the significant main effect of psychiatric co-morbidity for overall QoL domain (F=61.80 p<0.01) on QOLIE scale. However, the interaction between psychiatric co-morbidity, gender and marital status remained non-significant [Table/Fig-7].

Variables	One-way ANOVA results
Seizure worry	F ratio=1.090, p=0.27
Emotional well being	F ratio=1.075, p=0.38
Energy/fatigue	F ratio=1.359, p=0.25
Cognitive	F ratio=2.196, p=0.09
Med effects	F ratio=0.672, p=0.62
Social functioning	F ratio=0.310, p=0.88
Overall QoL	F ratio=0.342, p=0.85
Overall score	F ratio=1.147, p=0.34

[Table/Fig-4]: Comparative analysis of scores on domains of QOLIE-31 Scale between 'age of onset of epilepsy' of the study population using one-way ANOVA.

Variable	One-way ANOVA results
Seizure worry	F ratio=1.870, p=0.13
Emotional well being	F ratio=1.692, p=0.17
Energy/fatigue	F ratio=2.724, p=0.03
Cognitive	F ratio=2.852, p=0.03
Medication effects	F ratio=1.485, p=0.22
Social functioning	F ratio=0.897, p=0.48
Overall QoL	F ratio=2.087, p=0.1
Overall score	F ratio=2.017, p=0.1

[Table/Fig-5]: Comparative analysis of scores of domains of QOLIE-31 scale between 'total duration of epilepsy' subgroups of the study population using one-way ANOVA.

Variables	Group I (Without psychiatric co-morbidity) Mean±SD	Group II (With psychiatric co-morbidity) Mean±SD	t-value	p-value
Seizure worry	50.40±20.63	15.75±12.61	7.846	0.01
Emotional well being	81.73±16.43	33.20±19.43	10.446	0.01
Energy/fatigue	64.83±14.11	42.33±28.99	3.821	0.01
Cognitive function	56.36±18.47	35.70±18.99	4.272	0.01
Medication effects	55.36±21.71	42.31±26.78	2.073	0.043
Social functioning	61.62±20.98	28.43±16.28	6.844	0.01
Overall QoL	59.78±18.14	37.58±18.45	4.700	0.01
Overall score	62.66±11.09	33.53±16.58	7.997	0.01

[Table/Fig-6]: Comparative analysis of scores of domains of QOLIE-31 scale between group I and group II using t-test.

Source of variation	Sum of squares	Df	Mean sum of squares	F ratio	Sig.
Psychiatric co-morbidity	12046.01	1	12046.01	61.80	0.01
Gender	151.63	1	151.63	0.778	0.382
Marital status	2.13	1	2.13	0.011	0.917
Psychiatric co-morbidity *Gender	708.78	1	708.78	3.636	0.062
Psychiatric co-morbidity *Marital status	67.69	1	67.69	0.347	0.558
Gender *Marital status	372.28	1	372.28	1.910	0.173
Psychiatric co-morbidity *Gender *Marital status	199.73	1	199.73	1.025	0.316
Error	10135.81	52	194.92		
Total	163099.73	60			

[Table/Fig-7]: Three-way ANOVA for overall score on QOLIE-31 scale.
*Interaction effect

DISCUSSION

Epilepsy is a chronic condition that has various psychological implications. Despite understanding of psychiatric co-morbidity in PWE, especially depression and anxiety, the symptoms are often under reported and under recognised [17-23]. In the present study also, the most common psychiatric co-morbidity was major depressive disorder. However, in the study conducted by Osman A et al., non epileptic attack disorder was the most common co-morbidity followed by affective disorders [21]. This difference from present study findings can be attributed to the tool used for evaluation of psychiatric disorder {Mini International Neuropsychiatric Interview (Version 6.0)}, which does not include module for the diagnosis of dissociative convulsions/non epileptic attack disorder.

In this study, scores of various domains of QOLIE-31 scale did not differ due to age of the study participants. The study finding align with previous research by Norsa'adah B et al., and Sajatovic M et al., which reported no significant difference in mean QOL scores due to socio-demographic factors [24,25]. This was however in contrast with the findings by Ashwin M et al., and Melikyan E et al., where scores of various domains decreased with increasing age [26,27]. This could possibly result from the diagnosis of epilepsy for the first time in later life. It can be a poor prognostic factor for older people as it is a chronic health condition adding to the burden of old age in terms of loss of independence. However, in the present study there were no extreme of age patients who were diagnosed for the first time. Moreover, less stigma and employment insecurities are perceived in old age as compared to young age. Therefore, PWE at different age groups perceive different psychosocial stressors and they need to be addressed timely [28].

The study results yield a significant main effect of socio-economic status for emotional well being, energy/fatigue, cognitive functions and overall score. It was consistent with previous studies which have found significant correlation of economic variables like household income with QOL independent of depression and seizure

control [25,29,30]. Chronic health conditions like epilepsy add to the occupational dysfunction and are independent risk factors for various psychiatric co-morbidity. In addition, there is financial burden for disease management itself. Therefore, vocational counselling services, welfare schemes and occupational rehabilitation can aid in improving QOL in PWE.

The scores of various domains of QOLIE-31 scale did not differ by age of the patient at the onset of epilepsy. This is consistent with studies done in the past [31,32]. This can be explained by various factors such as employment status, side effect profile of Anti-Epileptic Drugs (AEDs) and co-existing co-morbidity at any age. However, it has been emphasised that there is impairment in QOL in PWE who have been first diagnosed in later life attributing it to poor adjustment to a chronic health condition in old age, psychosocial impairment and poor tolerance to AEDs [33]. Therefore, holistic management at any age of onset is required to improve the QoL in PWE.

In this study, a significant effect of total duration of epilepsy was found on the domains of energy/fatigue and cognitive functions on QOLIE-31 scale. The findings was consistent with previous reports [17,27]. Subjective fatigue and lack of energy are commonly reported in PWE. It can be attributed to AEDs which have sedative property or underlying depressive disorder [34]. Furthermore, the neuronal dysfunction, structural lesions and long term use of AEDs can lead to impaired cognition [35,36]. Thus, early control of seizures with rational use of AEDs and addressing psychiatric co-morbidity is likely to have better outcome on the domains of QoL.

The results also suggest that the PWE with psychiatric co-morbidity have poorer QoL as assessed by QOLIE-31 scale in all the domains. The findings validate the already existing studies despite which psychiatric co-morbidity are overlooked especially in middle income countries [18,22,25]. Furthermore, in the present study the interaction effect of psychiatric co-morbidity, gender and marital status among the study population has been also evaluated. There was no significant interactive effect observed, thereby suggesting that psychiatric co-morbidity independent of gender and marital status affect the overall score on QOLIE-31 scale.

Limitation(s)

The study was limited by its cross-sectional design and small sample size. For a better understanding intervention regarding psychiatric co-morbidity and outcome study would have been better. Further, the use of self-reporting QOLIE-31 scale could have led to self deception and falsification of answers.

CONCLUSION(S)

The present study shows that QoL in PWE is associated with various psychosocial and clinical factors beyond seizure control. Thus, QoL in PWE can be improved with interventions targeting these factors. A significant difference in all the domains of QoL is observed in PWE without psychiatric co-morbidity and with psychiatric co-morbidity which clearly highlights need for screening for psychiatric co-morbidity and appropriate referral services in PWE.

The present study can also be considered as a template for studies with larger sample size and longitudinal design which can be conducted in future in middle income countries. This will help in better understanding of factors which can be generalised and targeted to improve the QoL in PWE. Professionals should acknowledge the uniqueness of each case, assess the individual's symptoms and psychosocial factors in a comprehensive manner, always consider the possibility of psychiatric co-morbidity and need for appropriate referral.

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PARTICULARS OF CONTRIBUTORS:
1. Resident, Department of Psychiatry, Institute of Mental Health, Rohtak, Haryana, India.
2. Professor, Department of Psychiatry, Institute of Mental Health, Rohtak, Haryana, India.
3. Senior Professor, Medicine, Department of Neurology, Pt. B.D. Sharma University of Health Sciences, Rohtak, Haryana, India.
4. Senior Professor and Head, Department of Psychiatry, Institute of Mental Health, Pt. B.D. Sharma University of Health Sciences, Rohtak, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Jagriti Yadav,
Pt. B.D. Sharma University of Health Sciences, Rohtak, Haryana, India.
E-mail: jagritipsyc07@gmail.com

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