

ORIGINAL ARTICLE

Sexual dysfunction in women with epilepsy

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ABSTRACT

Background: Sexual functioning and variables that influence sexual functioning have not been studied in Indian women with epilepsy.

Materials and Methods: In a pilot study, female (age, 18–45 years) outpatients with epilepsy who were in a stable sexual relationship for at least 1-year were screened using the mini international neuropsychiatric interview. Those without anxiety or depressive disorders ($n = 60$) were studied using the female sexual function index (FSFI; higher scores indicate better functioning). Findings were compared with age- and sex- matched sample of healthy control women drawn from the same sociodemographic population.

Results: Women with epilepsy had significantly poorer sexual functioning on all FSFI subscales (desire, arousal, lubrication, orgasm, satisfaction, pain), as well as on the total scale scores, and >70% of these women were rated as dysfunctional on individual FSFI subscales and on the total scale. In multivariate analysis, use of clobazam and phenobarbitone, and longer time after the last seizure were each associated with significantly higher FSFI scores; and longer duration of epilepsy was associated with significantly lower FSFI scores.

Conclusion: There is a substantial impairment of sexual functioning in women with epilepsy. This study demonstrates the need for increased awareness of the problem, better case identification, and improved seizure control.

Key words: Antiepileptic drugs, epilepsy, orgasm, sexual functioning, women

INTRODUCTION

Epilepsy is a neurological disorder characterized by recurrent unprovoked seizures.^[1] Approximately 1% of the population has epilepsy, which is a common health condition affecting women in the reproductive age group^[2] and the psychosocial effects of the disorder in women cannot and should not be neglected.^[3]

Sexual dysfunction in women with epilepsy is a multifactorial problem with psychological, biological, and social ramifications. Some data indicate that sexual dysfunction is a manifestation of hypothalamic dysfunction related to

seizures and interictal discharges.^[4] Antiepileptic drugs (AEDs) are suggested to contribute to the dysfunction, partly through hormonal effects on the hypothalamic-pituitary-adrenal axis.^[5] This is particularly true for drugs such as carbamazepine, phenytoin, and sodium valproate.^[6]

Sexual dysfunction in women with epilepsy is a neglected subject in India. This study, therefore, examined the prevalence and seriousness of sexual dysfunction in women with epilepsy, identified in an outpatient clinic. An attempt was also made to identify sociodemographic, clinical, and pharmacological determinants of sexual dysfunction.

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MATERIALS AND METHODS

This cross-sectional, pilot study was carried out on women with epilepsy attending the neurology outpatient department (OPD) of Jagadguru Sri Shivarathreshwara Hospital, Mysore, India. The study was conducted between January 2014 and December 2014. The study was approved by the Institutional Ethics Committee.

The sample is comprised of 60 women with epilepsy (cases) and 60 age- and sex- matched healthy controls. The size of the sample was arbitrarily decided with a view to obtain as much of representativeness and precision of information as possible within the scope of a pilot study. All cases met International League Against Epilepsy criteria for epilepsy.^[7] Controls were sourced from among the relatives of patients attending the OPD; that is, from the same socioeconomic and cultural population as the cases.

Written informed consent was obtained from all participants. Patients were eligible for selection if they were aged 18–45 years, if they had been receiving antiepileptic medication for at least 1-year, and if they were having regular sexual activity with a stable sexual partner for at least 1-year. Exclusion criteria were diabetes, hypertension, thyroid disorders, history of substance abuse, pregnancy, comorbid anxiety or depression, and other acute and chronic medical and psychiatric conditions that could influence sexual functioning.

Clinical and treatment data were gathered using a structured questionnaire. The mini international neuropsychiatric interview plus^[8] was used to rule out anxiety and depression. Sexual functioning was assessed using the female sexual function index (FSFI), which is a 19-item, a self-rated instrument that assesses 6 key domains of sexual functioning in women.^[9] Each item is scored on a scale of 0 (or 1) to 5; a total score is also obtained, and higher scores indicate better sexual functioning. The FSFI domains are desire, arousal, lubrication, orgasm, satisfaction, and pain. Participants completed the FSFI alone, in a private room. Women who were not sufficiently literate to complete the FSFI on their own were assisted by a multilingual female health professional. An FSFI score <26.55 is classified as female sexual dysfunction; cut-offs for individual domains are also described.^[10]

Statistical methods

The descriptive statistics were computed with medians instead of means wherever the distributions were skewed. The independent sample *t*-test was used to compare the means of continuous variables (the Mann–Whitney test was applied wherever the data were skewed), and the Chi-square test was used to compare the frequencies of categorical variables. Pearson/Spearman correlations were obtained between continuous variables that were/were not normally distributed.

A backward stepwise regression analysis was conducted to identify variables that predicted a significant proportion of the variance in FSFI total scale scores. All statistical tests examined two-sided hypotheses. Alpha for significance was set at 0.05 for discrete tests; at 0.01 when FSFI subscale and total scale scores were compared between groups; and at 0.001 for the multiple correlation analysis. The latter two were to protect against the risk of a type 2 statistical errors.

RESULTS

A sociodemographic description of the sample is provided in Table 1. Relative to controls, women with epilepsy were less educated by an average of about 2 years, and their family income was less by about Rs. 2000/month. There were no differences between cases and controls in age, type of family, and pattern of occupation.

Women with epilepsy had focal seizures ($n = 17$; 28.3%) or generalized seizures ($n = 43$; 71.7%). The duration of epilepsy was 1–30 (median: 4) years. The total number of seizures experienced was 1–30 (median: 5), and the last seizure was 0.5–3.0 (median: 1) years ago.

Antiepileptic therapy was used in monotherapy in 34 (56.7%) women. Two drugs were used in combination in 18 (30.0%) women, three drugs in 7 (11.7%) women, and four drugs in one woman (1.7%). Phenytoin was used in 19 (31.7%) women, carbamazepine in 15 (25.0%), valproate in 20 (33.3%), phenobarbitone in 21 (35.0%), and clobazam in 15 (25.0%).

The FSFI subscale and total scale scores are presented in Table 2. Women with epilepsy had lower scores (indicating poorer sexual functioning) on all FSFI subscales, as well as on the total scale. When the prescribed cut-offs were applied to define dysfunction on specific subscales and on the total scale scores, women with epilepsy were again significantly more dysfunctional than controls on all subscales and on the total scale scores [Table 3].

Table 1: Sociodemographic description of women with (cases) and without (controls) epilepsy*

	Cases ($n=60$)	Controls ($n=60$)	Significance**
Age (years)	18-45 30.7 (6.4)	18-43 29.9 (6.8)	$t=0.64$; $df=118$; $P=0.53$
Education (years)	0-15 5.7 (4.2)	0-15 7.5 (4.6)	$z=2.65$; $P=0.008$
Occupation			
Private	54	50	Chi-square=1.15; $df=1$; $P=0.28$
Student	6	10	
Family			
Nuclear	31	26	Chi-square=0.84; $df=1$; $P=0.36$
Joint	29	34	
Income (in 1000s of rupees per month)	4.2 (4.0)	6.4 (5.6)	$z=3.97$; $P<0.001$

*Data presented are range, mean (SD) or frequency counts; **Independent sample *t*-test, Mann–Whitney test with *z* corrected for ties, or Chi-square test. SD – Standard deviation

Table 2: FSFI scores of women with (cases) and without (controls) epilepsy*

	Cases (n=60)	Controls (n=60)	Significance**
Desire	3.6 (1.2)	4.3 (1.4)	t=3.02, df=118, P=0.003
Arousal	3.5 (1.4)	4.6 (1.5)	t=4.21, df=118, P<0.001
Lubrication	4.3 (1.3)	5.2 (1.1)	t=4.14, df=118, P<0.001
Orgasm	3.8 (1.0)	5.1 (1.3)	t=6.24, df=118, P<0.001
Satisfaction	3.9 (1.5)	4.8 (1.5)	t=3.27, df=118, P<0.001
Pain	3.8 (1.4)	5.4 (0.8)	z=6.62, P<0.001
Total	8.0-33.6 22.6 (5.8)	12.5-36.0 29.5 (7.1)	t=5.79, df=118, P<0.001

*Data presented, where applicable, are range, mean (SD); higher scores indicate better sexual functioning; **Independent sample t-test or Mann-Whitney test with z corrected for ties; all P<0.01, the level set for significance. FSFI – Female sexual function index; SD – Standard deviation

Table 3: Percentage of women below the prescribed cut-offs on the FSFI

	Cases (n=60) (%)	Controls (n=60) (%)	Chi-square (df=1)*
Desire <4.28	70.0	33.3	16.15
Arousal <5.08	81.7	33.3	28.68
Lubrication <5.45	83.3	31.7	32.77
Orgasm <5.05	98.3	31.7	58.61
Satisfaction <5.04	80.0	31.7	28.42
Pain <5.51	90.0	28.3	47.22
Total <26.55	71.7	33.3	17.68

*All P<0.001 (alpha set at P<0.01). FSFI – Female sexual function index

Correlation coefficients were computed between age, years of education, income, duration of epilepsy, total number of seizures experienced, and time since the last seizure on the one hand, and FSFI subscale and total scale scores on the other hand. Recency of the last seizure was associated with poorer lubrication ($r = 0.42$), and greater duration of epilepsy was associated with poorer orgasmic functioning ($r = 0.44$). No other correlation survived correction for multiple testing ($P < 0.001$).

In the regression analysis age, years of education, occupation, type of family, income, type of epilepsy, duration of epilepsy, total number of seizures experienced, time since the last seizure, number of AEDs taken, and individual drugs used was set as independent variables with the FSFI total score as the dependent variable (this analysis was conducted only in women with epilepsy). The use of clobazam and phenobarbitone, and longer time after the last seizure were each associated with significantly higher FSFI scores; and longer duration of epilepsy was associated with significantly lower FSFI scores. No other variable significantly influenced the variance of the FSFI total score.

DISCUSSION

The prevalence of sexual dysfunction in women with epilepsy ranges widely in literature from 14% to 86%, depending on the nature of the sample studied, the definition of sexual dysfunction, and other variables.^[6,11-13] The higher prevalence

of sexual dysfunction has been noted among patients with difficult-to-treat epilepsy, those receiving polytherapy, and those with serious comorbidities.^[14] Because different studies used different methods to assess sexual dysfunction, because different studies assessed different outcomes, and the results are not comparable across studies. Some studies described sexual dysfunction in terms of arousability or frequency of sexual intercourse. Some studies focused on difficulties during sexual intercourse itself such as lack of lubrication, dyspareunia, or vaginismus. Some studies examined the quality of orgasm or global satisfaction with sexual life.

The status of the relationship is also an important determining factor, as women with epilepsy living in a stable relationship should have a greater expectancy of healthy sexual activity.^[15] As a positive in our study, we assessed only those women who had been in a stable sexual relationship with a regular partner for at least the past 1-year; despite this favorable bias, the cross-sectional prevalence of sexual dysfunction was more than twice as higher in women with epilepsy than in controls (72% vs. 33%, respectively). As a negative, the FSFI excludes women who are not in a relationship, and we may have excluded women with epilepsy with even greater risk of sexual dysfunction.^[14] In other words, our study might be an underestimate of the problem in the population.

Greater incidence of sexual dysfunction has been documented in focal epilepsy than in generalized epilepsy.^[16] Temporal lobe epilepsy is presumed to have a more negative impact on endocrine, sexual, and reproductive function because of involvement of temporal limbic areas.^[13] In this study, however, type of epilepsy did not influence FSFI total scores. A possible explanation is that we conducted a multivariate analysis, and other variables better explained FSFI total scores than did the type of epilepsy. It is possible that type of epilepsy may influence specific aspects of sexual functioning. We did not examine this in an exploratory analysis because, as in the correlational analysis, in the absence of *a priori* hypotheses, the results are unlikely to survive corrections for multiple statistical testing.

We found that longer duration of epilepsy was associated with poorer sexual functioning. This can be explained in both biological and psychosocial ways. Biological involvement of limbic brain territories and projections therefrom to the hypothalamus.^[17] Psychosocial people with a longstanding illness may exhibit illness behavior that includes poorer involvement in sexual activity.

We found that seizure freedom was significantly associated with better sexual functioning. Other authors have also obtained similar findings, such as an association with better scores for lubrication, orgasm and pain.^[14] Patients who were seizure-free have also been shown to have a higher level of sexual functioning, and vice-versa.^[18]

On a final note, studies have examined the relationship between sex hormones and AEDs. Androgens have been considered to play an important role in sexual functions, particularly in maintaining the sexual desire and arousal.^[19] Nevertheless, whether impaired sexual functioning in epilepsy is due to decreases in androgen levels is controversial.^[20,21] Focal seizures have been associated with decreased desire and arousal in combination with carbamazepine treatment.^[14] In our study, however, we found better levels of sexual functioning related to treatment with clobazam and phenobarbitone, and that the other AEDs (phenytoin, carbamazepine, valproate) were not significantly associated with either better or worse sexual functioning. Because this was not a randomized controlled trial of different AEDs, we can only make a cautious suggestion for preferring these two AEDs (clobazam, phenobarbitone) over the other AEDs when prescribing to women with epilepsy for whom sexual functioning is an important consideration. Due consideration needs to be paid to the possibility that clobazam and phenobarbitone may have been systematically prescribed to women with certain clinical or other characteristics that were associated with better sexual functioning, and that, therefore, residual confounding explained their association with better sexual outcomes. In any case, before preferring these two AEDs, adequate seizure control will always remain the primary consideration when treating epilepsy; as already indicated earlier longer duration of seizure freedom will also improve sexual outcomes.

We acknowledge that we did not have data on other new AEDs (e.g., lamotrigine, topiramate, and levetiracetam) and so cannot comment on the effect of these AEDs on sexual functioning.

Implications

This was a pilot study, but it nevertheless provides sufficient indication that in women with epilepsy, there is a need for increased awareness and proper case identification to detect and manage sexual dysfunction. Future research should be conducted on large samples so that multivariable analysis can reliably indicate social, clinical, and pharmacological determinants of individual domains of impaired sexual functioning as well as impaired overall functioning. It is particularly important to identify modifiable variables that may impact upon sexual functioning. This has implications for management programs.

CONCLUSION

The prevalence of clinically significant impairment in different domains of sexual functioning is 2–3 times higher in women with epilepsy than in healthy controls drawn from the same socioeconomic and cultural population. This prevalence ranges from 70% (impaired desire) to 98%

(impairments in orgasmic functioning) in individual sexual domains, and is 72% for the overall prevalence of clinically significant impaired sexual functioning. Women with longer freedom from seizures have better sexual functioning; those with longer duration of epilepsy have poorer sexual functioning. Among AEDs, clobazam and phenobarbitone are each associated with better sexual functioning, but this may be an artifact of residual confounding. Other AEDs (phenytoin, carbamazepine, and valproate), antiepileptic polytherapy, sociodemographic variables (age, education, income, occupation, type of family), classification of seizure, and other variables do not appear to have an independent effect on overall female sexual functioning.

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