

# The Study of Seizure Disorder in Women

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## Abstract

**Introduction:** Despite the increasing interest in sex differences in disease manifestations and responses to treatment, very few data are available on sex differences in seizure types and semiology. Both experimental and clinical evidence indicate that ovarian hormones exert a profound effect on neuronal excitability, though in a complex manner.

**Aim:** The aim was to study seizure disorder in 50 adult women.

**Methods:** A total of 50 adult women admitted with seizure were taken up for the study. Pseudoseizure, syncope, and movement disorder are excluded. Clinical history and physical examination were done in all patients.

**Result:** In this study, seizure occurred during the childbearing age in 78% compared to postmenopausal state which is 32%. The seizure occurred in 32% in the age group of 21–29 years. More common is the generalized seizure. 46% is idiopathic, and 28% is post stroke seizure.

**Conclusion:** Seizure occurrence is more common during childbearing age than the postmenopausal state. The idiopathic seizure occurs at a younger age. The generalized seizure is more common than partial seizure in this study. Stroke is the most common cause of seizure in elderly women.

**Key words:** Hormones, Seizure, Women's health

## INTRODUCTION

The seizure is a paroxysmal event due to abnormal, excessive, hypersynchronous electrical discharge from an aggregate of central nervous system neurons. The seizure is not a disease in themselves. Instead, they are the symptoms of a much different disorders affecting the brain. If an underlying chronic process leads to recurrent seizures, it is called epilepsy. Epilepsy affects ~50 million people worldwide and has a lifetime risk of ~3%.<sup>[1,2]</sup> The incidence and prevalence of unprovoked seizures are higher in men than women,<sup>[3]</sup> and status epilepticus is more frequent in men than women.<sup>[4]</sup> However, some idiopathic generalized epilepsies are more common in women, particularly juvenile myoclonic epilepsy and absence epilepsy.<sup>[5]</sup> There are no sex differences for patients with hippocampal

sclerosis on magnetic resonance imaging (MRI). Sex disparities after epilepsy surgery are reported with more favorable outcomes in women as well as men.<sup>[6]</sup> Men are 1–2.4 times more likely to have epilepsy than women. Epilepsy has a special implication for women health, and specific management strategies are required to solve the problem.

## Aim

The aim is to study seizure disorder in 50 adult women.

## MATERIALS AND METHODS

A prospective study was conducted in Thoothukudi Medical College Hospital for 6 months. A total of 50 adult women admitted with seizure in the intensive care unit were randomly included in this study. Pseudoseizure, syncope, and movement disorder are excluded. Clinical history and physical examination were performed in all patients. All patients underwent routine blood investigation electroencephalograph (EEG), and computed tomography (CT) scan brain/MRI brain were done in all patients.

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Month of Submission : 07-2018  
Month of Peer Review : 08-2018  
Month of Acceptance : 09-2018  
Month of Publishing : 09-2018

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## RESULTS

In this study, age varied from 13 years of age to 70 years of age. Eight patients were in 13–19 years of age accounting for 16%. In 21–29 years of age, 16 patients had seizure. Seven patients were in 30–39 years of age. In 40–49 years of age, six patients had seizure. Nine patients are in 50–59 years of age accounting for 18%. In 60–69 years of age, three patients had seizure. One patient had seizure at the age of 70 [Table 1].

Of 8 patients in the teenage group, 7 had generalized tonic-clonic seizure with irregular menstrual cycle and 1 had seizure with regular menstrual cycle. In this group, 2 had family history of seizure. EEG was abnormal in 6 patients and CT scan brain was normal in all of these 8 patients. Of 16 patients in 20–29 years of age, 8 had eclampsia. All eclampsia patients are primigravida. 1 of the 16 had postpartum cerebral venous thrombosis. CT scan brain and MRI brain with venogram showed evidence of cerebral venous thrombosis. Two of 16 had complex partial seizure and 4 of 16 had generalized tonic-clonic seizure during pregnancy. One patient at 24 years of age had late onset post-traumatic seizure. 2 of 7 patients in the age group of 30–39 had neurocysticercosis. 5 of 7 had seizure in already known idiopathic epilepsy. Of 6 patients in the age group of 40–49, 1 had hypoglycemia and other 1 had electrolyte imbalance. 4 of 6 in the age group of 40–49 had idiopathic epilepsy. Nine patients in the age group of 50–59, three patients in the age group 60–69, and one in 70 years of age had cerebrovascular accident with seizure. All cerebrovascular accident is of ischemic type. Patient in 70 years of age had right middle cerebral artery infarct with uremia [Table 2].

**Table 1: Frequency of age-wise seizure occurrence in 50 woman patients**

Age	Number of patients (out of 50) (%)
13–19	8 (16)
21–29	16 (32)
30–39	7 (14)
40–49	6 (12)
50–59	9 (18)
60–69	3 (6)
70	1 (2)

**Table 2: Etiology of seizure in 50 woman patients**

Etiology	Number of patients (out of 50) (%)
Idiopathic	23 (46)
Cerebrovascular accident	14 (28)
Eclampsia	8 (16)
Neurocysticercosis	2 (4)
Electrolyte imbalance	1 (2)
Hypoglycemia	1 (2)
Post-traumatic	1 (2)

Of 50 patients in the group, 33 patients had generalized seizure, 8 had simple partial seizure, 2 had complex partial seizure, and 7 had mixed seizure disorder [Table 3].

Of 50 patients in this group, 34 were reproductive period and 16 were postmenopausal state [Table 4].

## DISCUSSION

In our study, of 50 women patients, 34 were in reproductive age group, and 16 were in postmenopausal state. Seven patients in the age group of 13–19 in our study had seizure with irregular menstrual cycle and delayed periods. 1 of 7 patients in the teenage group had seizure with regular menstrual cycle. Cumming *et al.* reported over one-third of women with temporal lobe seizure as having an anovulatory cycle over a time frame of three cycles compared with <10% of control women or women with primary generalized epilepsy.<sup>[7]</sup>

Approximately 50% of women with epilepsy have an increased frequency of seizure during pregnancy. Only a small percentage of women with epilepsy have a decrease in the frequency of seizure during pregnancy. In our study, 16 patients of 50 women with epilepsy in the age group of 20–29, and 6 patients had increased seizure occurrence during pregnancy. This increase in frequency may be due to hormonal change, body fluid change, and salt retention. Absorption, distribution, and elimination of antiepileptic drug also vary during pregnancy. Poor sleep during third trimester may increase the seizure frequency. Women with epilepsy who are pregnant are considered as high-risk pregnancy which indicates high risk to mother and fetus. The study shows an increase in maternal seizure during pregnancy.<sup>[8]</sup>

In our study, 8 patients had eclampsia and all are primigravida in 20–29 age group. All these patients managed with magnesium sulfate, labetalol, and diuretic. Eclampsia is

**Table 3: Seizure type in 50 woman patients**

Seizure type	Number of patients (out of 50) (%)
Generalized seizure	33 (66)
Complex partial seizure	2 (4)
Simple partial seizure	8 (16)
Mixed seizure	7 (14)

**Table 4: Period of seizure occurrence in 50 women patients**

Period	Number of patients (out of 50) (%)
Reproductive period	34 (68)
Postmenopausal state	16 (32)

a vascular disorder, most common in young primigravida in the last trimester of pregnancy. The International Society for the Study of Hypertension in Pregnancy defines eclampsia as the occurrence of generalized convulsion associated with signs of preeclampsia during pregnancy, labor, or within 7 days of delivery not caused by epilepsy or other convulsive disorder. Unfortunately, 30–35% of cases of eclampsia remain unpreventable.<sup>[9-11]</sup>

In our study, one patient at 24 years of age had late onset post-traumatic seizure. Her CT scan brain showed post-operative bone defect with gliosis in left frontal lobe. Head trauma is associated with an increased susceptibility to seizure. Post-traumatic seizure may be earlier if seizure occurs <1 week of head trauma or late if seizure occurs >1 week of injury.<sup>[12]</sup>

One patient of 50 women with epilepsy in the age group of 40–49 had hyponatremia-induced seizure. Hyponatremia is associated with muscle cramps, weakness, confusion, and seizure.<sup>[13]</sup>

In our study, 14 patients 50 adult women with epilepsy had cerebrovascular accident. 13 patients had ischemic stroke, and all patients were >50 years of age. In our study, 1 of 50 women with epilepsy at the age of 24 had cerebral venous thrombosis. Impact of post stroke seizure on stroke outcome is unclear. 43% of stroke patients experienced a seizure within 24 h after stroke.<sup>[14]</sup> In patients with ischemic stroke, epilepsy developed in 35% of patients with early onset seizure and in 90% of patients with late onset seizure.<sup>[15]</sup> The risk for epilepsy was comparable in patients with hemorrhagic stroke: Epilepsy developed in 29% of patients with early onset seizure versus 93% with late onset seizure.<sup>[16]</sup>

## CONCLUSION

Seizure is more common in women of childbearing age than postmenopausal state. Eclampsia is seen in young primigravida in this study. Majority of seizure in our study

is idiopathic, followed by post stroke seizure. Generalized seizure is more common than partial seizure. Stroke is the most common cause of seizure in elderly women.

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**How to cite this article:** Sowthariya R, Anandan H. The Study of Seizure Disorder in Women. Int J Sci Stud 2018;6(6):91-93.

**Source of Support:** Nil, **Conflict of Interest:** None declared.