

A case presentation on generalized tonic-clonic seizures diagnosis and treatment care services and outcomes in a teenage patient

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Abstract

Seizure is a short event of abnormal electrical activity in the brain with intense electrical signals. Epilepsy is difficult to diagnose. Miss XYZ is an unmarried 16 years (running) female from rural village of Syngja district, Nepal with normal birth, growth and development, currently studying at 10th grade started having frequent seizure since she was of 9 months old after she had been immunized with a vaccine (Pneumo-coccal Conjugate Vaccine and Measles-Rubella). She was brought to outpatient department ward of local hospital on 19th October 2016 with complaints of sudden stiffness, falls, and loss of consciousness for few minutes, salivation and impaired memory for some time. Struggling with improper diagnosis in many hospitals, the case was finally diagnosed with generalized tonic-clonic seizure at 12 years of age. The electroencephalogram of the brain showed abnormal waves with normal physical and laboratory examinations findings during diagnosis. The case was then started treatment with sodium valproate and currently is under regular follow up with seizure controlled status since around last one year. Thus, initiating awareness programs on disease prevention and management in rural settings, regular patient follow-up care, and medication adherence can reduce the individual's disease burden and hospital revisit which can ultimately promote health-related quality of life.

Keywords

Epilepsy; seizure; case; generalized tonic-clonic

Introduction

Seizure is a short event of abnormal electrical activity in the brain with intense electrical signals [1]. The word “epilepsy” is derived from a Greek term «epilambanein», meaning “to be seized” or «to attack» [2]. Epilepsy is defined as having two or more unprovoked seizures and is characterized by recurrent seizures, which are brief episodes of involuntary movement that may involve a part of the body (partial) or the entire body (generalized) and are sometimes accompanied by loss of consciousness and control of bowel or bladder function [3]. It can be caused by several state of affairs that affect a person’s brain. Examples include stroke, head injury, childbirth complications, infections (like meningitis or cysticercosis), and some genetic disorders. Often, no definite cause can be found for this [4]. Epilepsy is challenging to be well diagnosed and misdiagnosis is very common. Any individual who experiences his or her first seizure must be seen by an expert within two weeks to ensure an accurate diagnosis and beginning of therapy if suitable [5]. The diagnosis includes complete blood count test, brain computerized tomography scan, magnetic resonance imaging (MRI), electroencephalogram which offers the evidence and reveals clearly the origin of seizure lesions in the brain [6]. Generalized tonic-clonic seizures is characterized by bilateral convulsion with loss of awareness and for instance it begin, progress, and end with jerking of the arms and legs on both sides of the body, together with the head, neck, face, and body on most occasions. These are explanations about what exactly happens during the episode and can contribute for an accurate diagnosis [7].

Case Report

Miss XYZ is an unmarried 16 years (running) female from rural Nepal with normal birth, growth and development, currently studying at 10th grade who started having frequent seizure since she was of 9 months old after she had been immunized with a vaccine (Pneumococcal Conjugate Vaccine and Measles-Rubella). After a frequent misdiagnosis in many health facilities inside country, she was brought to outpatient ward of local hospital on 19th October 2016 at the age of 12 with complaints of sudden stiffness, falls, and loss of consciousness for few minutes, salivation and impaired memory for some time. Further, the complaints by her family members included that the case remained unresponsive and unable to recall events after she retrieved from the episode and experienced memory disturbances along with drowsiness. As she used to regain from her loss of consciousness after few minutes, she used to speak in her own way that she don’t know what she is speaking.

Diagnosis: As per the EEG and lab report, the case was diagnosed with the generalized tonic-clonic seizure.

Family history: Her family history shows that there were no any single individual with epilepsy till date in her family circle. Also no family members are having any kind of disease too.

Personal history details: The patient’s mother started sharing the past medical history of her daughter by recalling the moment around 15 years back. «My daughter was immunized with a vaccine when she was 9 month old. The next day she had a seizure with involuntary body movement and salivation. She had sudden stiffness, falls, and loss of consciousness for few minutes with impaired memory for some time. The

moment was scary for me and I was totally unknown what was happening». The case was also having fever after vaccination which her mother thought as a reason for seizure. Case was taken to the local health post where she was given medicine to control fever. Family thought that it will be ok now but it was just two to three month when the seizure re-appeared. Further she was taken to different hospitals of Nepal where she was always misdiagnosed and provided with medicine for fever. This was how the case had gone through frequent episode of seizure up to 12 years of her age.

Before seven years back from now, case was living in a village with her mother, a younger brother and a younger sister. She was taken to the different hospitals of different cities of Nepal where she was always misdiagnosed and provided with medicine for fever. Further, people in village suggested to treat the case with local traditional healer (Dhamijhakri). Her mother shared that, she did everything for her and spend lots of money for her proper treatment either it was in medical treatment or in traditional treatment practice. But what they got in return was only the frequent seizure episode in her child. After her family started living in city area, they came in contact with a senior nurse nearby their house. Through the same nurse, the case was taken to recommended hospital on 19th October 2016 where the nurse used to work. This was only when she got proper diagnosis of epilepsy at the age of 12 years. Now she is under medication with anti-epileptic drugs since three and half years. During the course of her medication thinking that she is now getting very well, with self-decision the patient withdraw the medications for some duration in between but again she visited hospital on 24th Jan 2020 after she had re-occurrence of seizure episode. After which she is practicing regular follow up with continue medications.

General examination progress chart

During OPD visit on 19th Oct 2016, physical examination records of the case shows that she was conscious, oriented, afebrile, pulse rate of 95 bpm, and with normal respirations. Her blood pressure was slightly low i.e. 100/70, and the temperature was normal. Details progress chart regarding physical examination at different visit of the case is presented in table 1. Similarly, her laboratory examinations findings is presented in table 2.

Table 1: Vital examinations.

| Date | Ht (cm) / Wt (Kg) | BP (mmHg) | PR (b/m) | RR/min | SPO ₂ | Temp |
|---------------|-------------------|-----------|----------|--------|------------------|------|
| 19th Oct 2016 | 136 cm/32 Kg | 100/70 | 95 | 28 | 97 % | 96°F |
| 21st Nov 2016 | 136 cm/32 Kg | 100/70 | 84 | 28 | 97 % | 96°F |
| 20th Jan 2017 | 136 cm/35 Kg | 100/75 | 104 | 26 | 96 % | 96°F |
| 26th Nov 2017 | 143 cm/40 Kg | 100/70 | 96 | 22 | 98 % | 96°F |
| 24th Jan 2020 | 155 cm/47 Kg | 90/60 | 112 | 22 | 96 % | 97°F |
| 3rd Feb 2020 | 155 cm/48.6 Kg | 100/60 | 86 | 20 | 98 % | 96°F |
| 10th Mar 2020 | 157 cm/48.3 Kg | 80/60 | 86 | 20 | 98 % | 97°F |

Laboratory examination report of the case shows that all the hematological value were in normal range while hemoglobin and calcium level were slightly low as compared to reference value. Similarly, her urine analysis does not shows pus cells in normal range.

Table 2: Laboratory examination.

| Date | Complete blood count | Electrolytes | Urine analysis |
|---------------|---|---|---|
| 19th Oct 2016 | WBC: 7200 mm ³ Neutrophils: 74% Lymphocytes: 21% Monocytes: 0.2% Eosinophils: 0.3% Basophils: 0% Hemoglobin %: 12.8 gm% Platelets: 1.98x10 ⁵ /μl | Sodium: 135.9 mmol/L Potassium: 3.8 mmol/L Calcium: 8.3 mg/dl | Color: light yellow Transparency:Slight turbid Protein: Nil Sugar: Nil Pus cells: 6-8/hpf Ep.cells: 4-6/hpf R.B.Cs: Nil/hpf |

Neurological investigation reports

The electroencephalogram (EEG) of the brain taken with patient relaxed and awake revealed well developed background alpha activity seen on the both side of with normal response to eye opening and closure. Slowing to theta range with occasional sharp wave activity noted on fronto-temporal region. Thus, EEG findings was reported abnormal on 19th Oct 2016 and 20th Jan 2017(Figure 1 and 2). Patient’s third EEG report on 27th Nov 2017, no epileptiform discharge or slowing was noted concluding EEG as a normal (Figure 3).

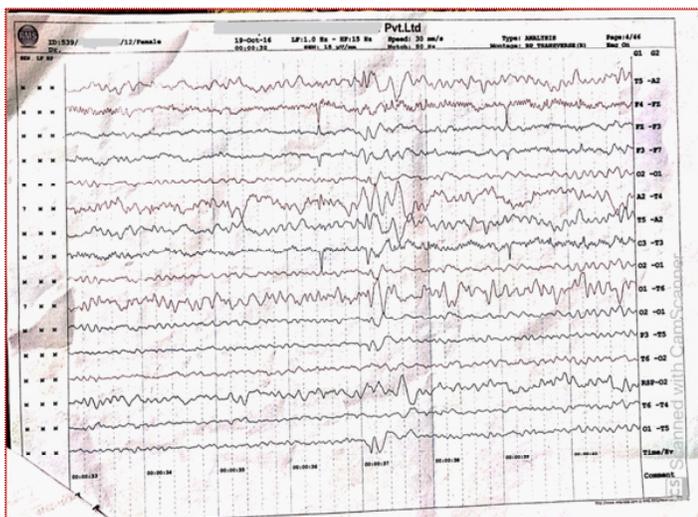


Figure 1: EEG report of 19 Oct 2016.

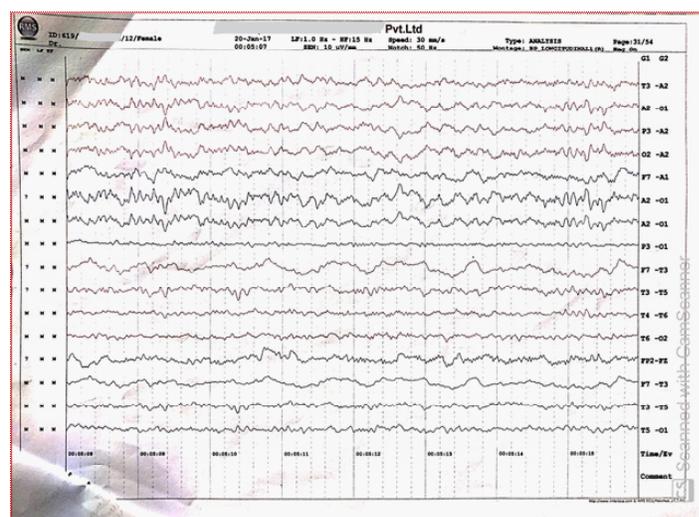


Figure 2: EEG report of 20 Jan 2017.

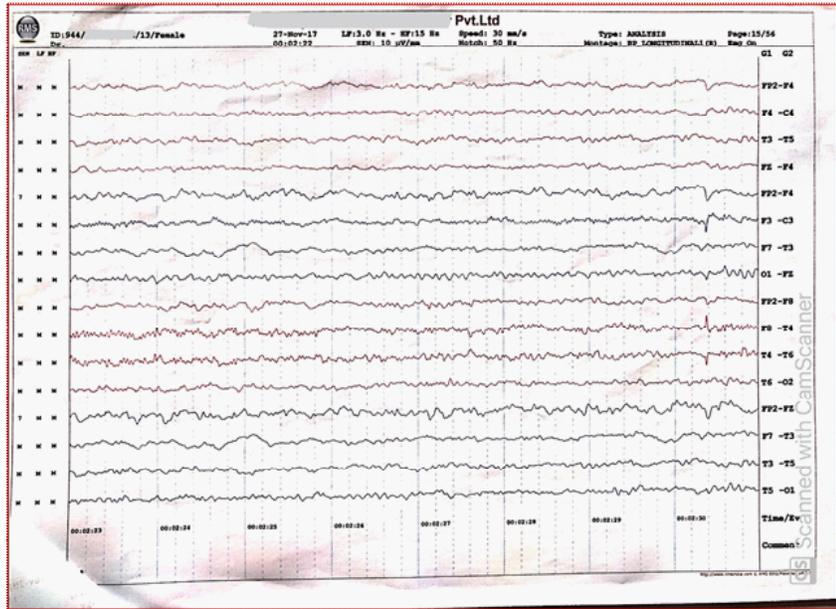


Figure 3: EEG report of 27 Nov 2017.

Patient medications chart

Patient was prescribed with sodium valproate which is first line treatment for generalized tonic-clonic seizure to control incidence of seizure. Similarly, as her calcium level was slightly low, she was prescribed with calcium as a supplementation. Detail medication chart of case is presented in table 3.

Table 3: Patient medication chart.

| Name of the medications | Dose | Indications |
|----------------------------------|---------------------------|---|
| At starting (19 Oct 2016) | | |
| Tab. Sodium valproate | 200 mg X BD | Anticonvulsant drug to control incidence of seizure |
| Syp. Vitamin B complex | 10 ml X BD (for 6 months) | For vitamin supplementations |
| Tab. Calcium + Cholecalciferol | 1 tab X OD (For 6 months) | For calcium supplementations |
| 26 Nov 2017 | | |
| Tab. Sodium valproate | 300 mg X BD | To control repetition of seizure |
| 24 Jan 2020 | | |
| Tab. Sodium valproate | Continue as before | To control repetition of seizure |
| Tab. Citicoline | 500 mg X BD | For improving nerve activity |

Discussion

The above clinical findings and laboratory tests reported that after a long time of misdiagnosis, the patient was detected with the episodes of generalized tonic-clonic seizures which are the most common type of seizure during childhood [8]. In the case, the patient was presented with generalized tonic-clonic seizure which progressively associate with loss of awareness [7]. The etiology represented that the case was immunized with a vaccine when she was 9 months old. Epilepsy is difficult to diagnose and misdiagnosis is common. Any individual who experiences his or her first seizure must be seen by an expert within two weeks to ensure an correct diagnosis and beginning of therapy if suitable [5]. But relating to this case, patient was taken to the different hospitals of different cities of Nepal where she was always misdiagnosed and provided with medicine for fever. Further, people in village suggested to treat the case with local traditional healer (Dhamijhakri). This is supported by the study in Nepal which showed that the Nepalese have strong belief that epilepsy originates with supernatural power of evil spirits or ghosts, and have common practice to pray gods for help [9]. After the correct diagnosis, the patient was treated with the drugs as shown in Table 3. She was thoroughly monitored and found that her vital signs were normal. Poor adherence of anti-epileptic drugs is considered as the most significant reason for ineffective treatment and re-occurrence of seizure [10]. In line with this reference, during the course of her medication considering her 3rd electroencephalogram (EEG) report (which was normal) and thinking that she is now getting very well, with self-decision the patient had withdrawal the medications for some duration as a result of which she had re-occurrence of seizure. This shows that patient did not responded well to the medication in between. Currently, she is now under regular medication and follow up which had shown positive improvement in her health conditions with no further seizure incidences in around last one year. The patient was advised for stress management, proper rest, and regular sleeping habits with healthy diet. An effective preventive measures planned and implemented effectively to the patient's health status can prevent the risk factors which eventually recovers quality of life among patient with epilepsy [11].

Conclusion

Timely and proper diagnosis is most significant steps in dealing with epilepsy patients to initiate effective medication strategy and control seizure in patient. The long years' time duration for Miss XYZ to be diagnosed with epilepsy concludes that epileptic patients are still facing the problem of misdiagnosis which indicates that clinical pharmacist are always a vital human resource in the field of clinical practice who can play significant role to recognize the risk factors for seizure origin, early correct diagnosis, and support to initiate treatment that can minimize the healthcare cost together with psychological burden to patient and their family members. Planning, implementation and evaluation of awareness activities at community level in resource poor country like Nepal regarding disease prevention and case management in rural settings, effective counselling to patient for regular follow-up, and proper medication adherence by patient can surely reduce the seizure episode which can ultimately decrease disease burden and minimize the hospital revisit and finally help in achieving optimal quality of life in them.

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