

## Clinical improvement of status epilepticus after delivery: A case report

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### ABSTRACT

Status epilepticus is a rare neurological complication of pregnancy, associated with significant maternal and fetal morbidity and mortality. Termination of pregnancy is not currently a management strategy. The clinical case was 35-year-old known epileptic presented with complaints of multiple convulsions of 2 days and loss of consciousness of a day. On examination, she was unconscious, with Glasgow Coma Scale 5/15, having repeated seizures, and blood pressure was normal. The assessment was status epilepticus and she was shortly admitted into the intensive care unit. She was eventually paralyzed and put on mechanical ventilation. She had a spontaneous delivery, subsequently improved, and was discharged on oral carbamazepine. Key aspects of this patient's management buttressed that status epilepticus can mimic eclampsia. That she significantly and progressively improved following delivery and that previous similar cases have been reported brings to bear that delivery might need to be considered as a management strategy for refractory status epilepticus.

**Key words:** Convulsion; delivery; pregnancy; status epilepticus.

### Introduction

Status epilepticus is a rare neurological complication of pregnancy, when it occurs; however, it can be associated with significant maternal and fetal morbidity and mortality. Eclampsia is the most common cause of seizures in a pregnant woman and is the first thing that comes to mind to an obstetrician, but epilepsy though estimated to occur in 5 per 10,000 people per year<sup>[1]</sup> should always be remembered as a possibility in pregnancy.<sup>[2]</sup> Estimates suggest that between 0.2% and 0.5% of pregnancies occur in women with active epilepsy.<sup>[3]</sup>

Pregnancy sometimes worsens the frequency of seizures in known epileptics; this has been explained by several mechanisms, one of which is that the physiological changes in pregnancy can lead to subtherapeutic serum levels of their drugs, and this occurs due to nausea and vomiting, decreased

gastrointestinal motility, antacid use that diminishes drug absorption, pregnancy hypervolemia offset by protein binding, induction of hepatic enzymes, placental enzymes that metabolize drugs, and increased glomerular filtration that hastens drug clearance. Second, seizure threshold can be affected by pregnancy-related sleep deprivation as well as hyperventilation and pain during labor. Finally, some women discontinue their medications due to the fear of the teratogenic effects of their drugs.<sup>[4]</sup>


The management thus of this condition involves the adjustment of dosage of medications, possibly with serum drug level monitoring to ensure an adequate therapeutic drug level. The use of a single medication is usually preferred

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**How to cite this article:** Obikili CG, Kahansim ML, Ocheke AN. Clinical improvement of status epilepticus after delivery: A case report. Trop J Obstet Gynaecol 2019;36:304-7.

Access this article online	
<b>Website:</b> www.tjogonline.com	<b>Quick Response Code</b> 
<b>DOI:</b> 10.4103/TJOG.TJOG_2_19	

due to the combined risk of teratogenic side effects when multiple agents are used.<sup>[4]</sup> In patients with status epilepticus, control of seizures is mandatory for the safety of the patient and fetus. Lorazepam is first line, followed by phenytoin or its equivalent, and then general anesthesia can be considered if seizures persist.<sup>[5]</sup> Delivery is generally not recommended as a treatment modality.

## Case History

A 35-year-old G8P7<sup>+0</sup> (7A) presented to the gynecological emergency with complaints of multiple seizure episodes of 2 days duration and loss of consciousness of a day's duration. She was a known seizure disorder patient diagnosed about 7 years ago and was on phenytoin but was not regular on follow-up or on her medications. She was in her usual state of health until 2 days prior to presentation when she developed generalized tonic-clonic seizures, each episode lasting about 3–4 min with associated upward rolling of the eyes, foaming of saliva in the mouth, and urinary incontinence. She had four episodes over a period of 48 h, and she was noticed to have lapsed into an unconscious state 24 h prior to presentation. Seizures were aborted with diazepam prior to her referral to our facility. Prior to now she had an average of one episode of seizure every 4 months. Her pregnancy had been otherwise uneventful.

On examination, she was a young woman, unconscious, afebrile, not pale, and there was no pedal edema. Her pulse rate was 116 bpm and her blood pressure was 100/70 mmHg which remained normal through out admission. She was dyspneic with a respiratory rate of 32 cpm. The symphysiofundal height was 30 cm and there was a singleton fetus in longitudinal lie and cephalic presentation. The cervix was closed and 2 cm long. Her Glasgow Coma Scale (GCS) was 5/15, and there were no signs of meningeal irritation and her pupils were 2.5 mm and bilaterally reactive to light. She had several episodes of seizure while being reviewed. Immediate resuscitation involved passage of an oropharyngeal airway and administration of intravenous (IV) midazolam bolus and in infusion. Urgent Random blood sugar (RBS) done was 3.5 mMol/L.; urinalysis done showed proteinuria of 3+, blood of 3+, and ketone of 1 + with other parameters normal; other investigations done were FBC + ESR, serum E/U/Cr, Ca<sup>2+</sup>, PO<sub>4</sub><sup>3-</sup> + uric acid, liver function test (LFT), hepatitis B surface antigen (HBsAg), hepatitis C virus (anti-HCV), and RVS and were essentially normal. A bedside ultrasound scan (USS) showed a live singleton fetus at 34 weeks of gestation in longitudinal lie and cephalic presentation. phosphatidylinositol glycan (PIGF) and structures of saframycins (sFMS) like tyrosinase could not be done due to nonavailability in the managing facility.

She was managed by the obstetrician, neurologist, and anesthesiologist. A seizure chart was kept, urethral catheter was passed with strict input/output charting, a nasogastric (NG) tube was passed for feeding and medications, and she was nursed in a left lateral position with 2 hourly turning. Decision was made for the patient to be admitted into the intensive care unit where she was subsequently intubated. Despite maintenance on midazolam infusion at increasing doses, she continued to have breakthrough seizures which progressed to continuous seizures. She was placed on IV sodium thiopentone 100 mg PRN and then IV phenobarbitone 200 mg 6 hourly. Within 24 h of admission, she delivered a live female neonate with birth weight of 2.25 kg and APGAR scores of 5 and 7 in the first and fifth minutes, respectively. With seizures still unabated on the same day, an assessment of status epilepticus not responding to conventional medications was made and a decision to paralyze her with IV pancuronium followed, and she was then commenced on mechanical ventilation after which she became seizure-free. Pancuronium infusion was maintained and she was switched from intermittent positive pressure ventilation (IPPV) to synchronized intermittent mechanical ventilation (SIMV) and was commenced on tabs tegretol 400 mg 12 hourly (crushed and given through the NG tube) while IV phenobarbitone 6 hourly was continued. The baby was commenced on breast milk substitutes. She still had intermittent seizures which sometimes required midazolam to be aborted. About 48 h into the admission and 24 h after paralysis she was weaned off pancuronium and midazolam and commenced on low-dose propofol infusion at 0.1 mg/kg/min and graded oral feeds were commenced through NG tube. About 24 h later and after she had been seizure-free for 48 h, the patient was noticed to be making adequate breathing efforts and was weaned off propofol and mechanical ventilation. Her blood pressure remained normal during this period. On the fifth day of admission, her GCS improved to 10T/15 and she was then extubated. On the eighth day, she was transferred to the female medical ward. Her clinical condition improved while in the ward, regaining full consciousness with no obvious neurological deficits and she was discharged home after 13 days of admission, having been seizure-free for a week. She was followed up at the neurology clinic and postnatal clinic in 2 weeks.

## Discussion

Status epilepticus in pregnancy being an uncommon presentation represents an avenue for learning and understanding how it affects pregnancy and how pregnancy affects the condition. It is said to occur when there is a single epileptic seizure lasting more than 5 min or two or more seizures within a 5-min period without the person

regaining consciousness between them.<sup>[6]</sup> This patient had multiple seizures under 5 min interval with sustained loss of consciousness. The first task was differentiating this case from eclampsia, which is a more common cause of seizures in pregnancy, the history of her being a known epileptic patient, poor on follow-up, and not regular with her medications. She was also notably a multiparous woman with no history of hypertension or hypertensive disorders in pregnancy. Also, examination findings with absence of pedal edema as well as a normal blood pressure throughout her admission also hinted against eclampsia, thus despite a proteinuria of 3+ the diagnosis of status epilepticus was favored. The additional knowledge that status epilepticus can cause proteinuria<sup>[7]</sup> would also aid the understanding of the spectrum of her illness. The presence of proteinuria otherwise would have posed a diagnostic dilemma, worse so if she had hypertension which sometimes can also complicate status epilepticus.<sup>[7]</sup> Thus, other causes of status epilepticus such as posterior reversible encephalopathy syndrome, cortical venous thrombosis, and autoimmune encephalitis must be remembered as differentials.<sup>[8]</sup>

The management of a patient with status epilepticus can be quite challenging with several cases reported in which multiple classes of medications were needed to control the seizures,<sup>[7,9,10]</sup> and this was the situation in this patient who had midazolam, phenobarbitone, sodium thiopentone, and diazepam. Despite these multiple agents, the seizure remained unabated until general anesthesia was instituted, and this is sometimes necessary and has been reported in some cases<sup>[11]</sup> and is recommended as a last resort.<sup>[5]</sup>

Pregnancy can affect the course of epilepsy by the physiological changes causing suboptimal therapeutic blood level of drugs as well as poor compliance with medications due to fear of its teratogenic effects as seen in this patient; these factors could have contributed to the deterioration of the patient's condition. Cases have been reported in which termination of pregnancy has resulted in an almost immediate resolution of symptoms,<sup>[11]</sup> and that is the interesting aspect of this patient's management because following delivery her clinical condition appeared to progressively improve and she was subsequently weaned off general anesthesia, extubated, and then regained full consciousness.

However, the interval between her delivery and the paralysis with pancuronium was just 2 h apart, so the immediate abatement of the seizures cannot solely be linked to her delivery. It is still important to note that from that point onward her clinical condition progressively improved without further increase in her medications but a tapering

down and decline in external control of respiration (switching from IPPV to SIMV). This, together with previous reports of improvement following termination of pregnancy, should be sufficient to attract a second look at termination of pregnancy as a management option for refractory status epilepticus, particularly as there are not many protocols for management of this condition in pregnancy.<sup>[12]</sup>

It is relevant to note that one of the common complications of status epilepticus is labor and preterm delivery<sup>[4]</sup> with reported cases,<sup>[13]</sup> so it appears as is seen in many pregnancy-related conditions that the body in a sort of self-preservation mechanism tends to attempt to evacuate the contents of the uterus. This was observed in this patient as she went into spontaneous labor and eventual delivery. This perhaps was contributory to her recovery. An opposing factor, however, is that most physiological changes in pregnancy are slowly reversed over a course of 6 weeks so a rapid improvement cannot solely be explained by these. Other factors, particularly placental hormones and enzymes, are immediately reversed as well as a reversal of the hemodynamic changes in pregnancy so the possibility of termination of pregnancy resulting in improvement of this condition can still not be ruled out.

## Conclusion

Status epilepticus can still represent a diagnostic dilemma due to its potential to present with features similar to eclampsia, particularly in patients presenting for the first time. Some grey areas still persist as to what extent an ongoing pregnancy affects the management of this condition and if termination of pregnancy should be considered as a management strategy. Possible follow-up with case series and subsequently higher level works (beyond case reports) would help in answering these emerging questions.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Ethics clearance

Ethical clearance was obtained from the hospital authority in September 2018.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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