A rare case of drug resistant adult-onset temporal lobe epilepsy due to a focal cortical dysplasia revealed by ictal coughing: First report in sub-Saharan Africa

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Abstract

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KEY CLINICAL MESSAGE

This case suggests that clinicians should consider seizures as a differential diagnosis of paroxystic cough with loss of consciousness. Focal cortical dysplasia should equally be screened for with MRI scans even in adults with epilepsy in sub-saharan Africa.

KEY WORDS: epilepsy, ictal coughing, mesial temporal lobe epilepsy, focal cortical dysplasia, malformations of cortical development

Introduction

Epilepsy is a very polymorphic neurological disorder both semiologically and etiologically and the terminology "the epilepsies" has been proposed by certain authors to englobe these disorders [1]. Furthermore, in a context where the etiologies of epilepsy are dominated by infections [2] and in the midst of misconceptions and stigma [3], the diagnosis and management of uncommon forms of the condition can be very difficult. Generally, the epilepsies constitute a diagnostic challenge particularly in cases revealed by non-motor symptoms [4]. Structural causes of epilepsy are often considered in the adult population but are not always identified hence the use of the term "cryptogenic" in the 1989 classification of the International League Against Epilepsy (ILAE) now categorised as "unknown" etiology since 2017 [5, 6]. Abnormalities of cortical development represent a significant proportion of the "cryptogenic" group in adult epileptology as they can be missed even with standard MRI sequences [7]. More so, they represent the second cause of medically intractable epilepsy in the adult population [8]. We report a rare case of late onset left mesial temporal lobe epilepsy due to a focal cortical dysplasia revealed by an infrequent non motor manifestation which had a peculiar evolution. To the best of our knowledge, this is the first case report in neurologic sub-Saharan Africa.

CASE PRESENTATION

A 46-year-old right-handed male presented with 5 episodes of transient loss of consciousness over the past two weeks prior to consultation. The episodes always began with a cluster of dry cough which lasted about 10

seconds, followed by an altered level of consciousness for a period of approximately 5 minutes during which observants described incomplete eye opening, jerky movements of both upper limbs but immobile lower limbs. The postictal period was characterized by amnesia and disorientation for a few seconds without any associated tongue biting nor anal/urinary sphincter dysfunction. The patient did not report any feelings of fear, panic, anxiety, déjà-vu or stomach upset prior to the loss of consciousness. The episodes were stereotyped with no prodromal symptoms and did not have an orthostatic component. The patient was well in between seizures and did not report any fever.

His past medical history revealed an HIV (Human immunodeficiency virus) infection diagnosed six years earlier. He was compliant on a first-line highly active antiretroviral therapy (HAART) regimen according to the national protocol (Tenofovir, Lamivudine and Efavirenz) and had an undetectable viral load a few months earlier. He reported no other chronic neurologic, cardiac or respiratory disorder and did not smoke. He admitted having a history of several febrile seizures in his childhood. There was a family history of epilepsy: a maternal cousin began having seizures during infancy and was well controlled on antiseizure medication.

On physical examination, his vital signs were within normal values (heart rate at 75 beats per minutes, respiratory rate at 18cycles per minute, oxygen saturation at 96% and temperature of 36.9°C). He looked well and had no focal neurologic deficits. Evaluation of the cardiovascular and respiratory systems was equally unremarkable.

Normal investigations (electrocardiogram (ECG), transthoracic echocardiography (TTE) and chest X ray) ruled out a reflex convulsive syncope. The relatively long duration of the crises, the absence of prodromal symptoms (dizziness, light-headedness, and diaphoresis) and post-ictal confusion argued against a syncope. The metabolic and infectious tests were normal. The episodes were thus labelled focal impaired awareness non motor seizures probably of temporal lobe origin considering prominent dysautonomic symptoms.

A scalp EEG revealed interictal epileptic discharges in the anterior and mid left temporal lobe (Figure 1). A contrast enhanced cerebral CT scan was strictly normal but a 1.5Tesla Brain MRI performed subsequently revealed a focal cortical thickening in the left parahippocampal gyrus coupled with flattening of its sulci and slight vertical orientation of the left collateral sulcus (Figure 2 A and B). It also revealed a small T2 hyperintense and T1 hypointense signal in the left hippocampus as well as diffuse cortical atrophy. There were no signs of hippocampal sclerosis; no mass or other signal abnormalities were identified. Given these findings, a final diagnosis was made of a late onset mesial left temporal lobe epilepsy (MTLE), caused by a focal temporal cortical dysplasia.

Sodium valproate (750mg daily) was started with a short course of clonazepam (2mg daily for seven days), considering the high frequency of the seizures. At a two weeks follow-up visit, the patient reported seizure resolution (including ictal cough) on the same day the antiseizure medications where instituted. Thirty-three months later, the patient was still seizure-free on the initial monotherapy instituted and had no particular complaints. The patient reports to be quite comfortable with his treatment.

DISCUSSION

This case highlights among other issues the importance of a detailed clinical evaluation in the diagnosis of episodes of transient loss of consciousness particularly in resource limited settings like sSA where sophisticated electrophysiological and imaging tests are not always available [9], coupled with challenges in diagnosis and management brought about by misconceptions, stigma and a predominance of infectious causes [2,3].. Indeed, loss of consciousness following coughing generally suggests a reflex syncope [10]. However several elements in the history of this patient argued against syncope. These include: the absence of prodromal symptoms such as light-headedness, dizziness and sweating; the absence of an orthostatic component and the short duration of the crisis (less than 30 seconds) [11]. Post-ictal confusion/disorientation was in a favour of a focal impaired awareness seizure [12].

Ictal coughing is a rare seizure manifestation described in about 0.28% of all epileptic seizures in certain series

[13]. Ascertaining the epileptic origin of cough would typically require the presence of ictal confirmation on a video EEG monitoring [14]. When available, inter-ictal scalp EEG is usually the only neurophysiological tool at the disposal of the neurologist practicing in resource limited settings [15, 16]. The inter-ictal EEG of our patient showed epileptic discharges in the left anterior and mid temporal lobes in favour a mesial temporal lobe epilepsy [17]. Several studies have reported ictal coughing as a feature of temporal lobe epilepsy [13, 18]. Fauser et al. after studying 197 patients with both ictal and post-ictal coughing concluded that patients presenting with cough as a regular element of their seizure semiology were most likely to have temporal lobe epilepsy while those with cough as a sporadic manifestation could have extra temporal lobe epilepsy [19]. Roux et al. studied changes in brain connectivity during ictal coughing and equally described a medial temporal origin [20]. On the contrary to ictal/post ictal coughing, pre-ictal cough has however been very rarely described. Ibrahim et al. reported a unique case in a 45-year-old male in whom cough preceded the onset of a generalized seizure provoked by hyperventilation. [21]. Therefore, despite the absence of an ictal EEG, the inter-ictal findings correlated with the clinical picture and were in favour of ictal epileptic coughing in our patient. This was even more plausible as no other cause (cardiac or respiratory) could explain the symptom in this case, which disappeared immediately with antiseizure medication. Clinical diagnosis of epilepsy (which requires a meticulous assessment of the patient and a mastery of seizure semiology particularly of non-motor subtypes) thus remains primordial for physicians practicing in sSA to compensate for the lack of technical resources.

Malformations of cortical development (MCD) as a whole are a relatively rare cause of epilepsy in the adult population as seizures usually occur earlier in life [22]. Its prevalence in patients with focal epilepsies varies between 3 and 12% [23-25]. The specific prevalence of focal cortical dysplasia (FCD) is about 1.1% [26]. Data on MCD in sub-Saharan Africa (sSA) is scarce. Ackermann et al. found a prevalence of 3.6% of MCD in a cohort of children with epilepsy followed-up at a tertiary centre in South Africa out of which FCD accounted for 0.7% [27]. Studies carried out in Burkina Faso and Cameroon reported prevalence rates of MCD's at 2.6% and 0.34% respectively but no case of FCD was identified [28, 29]. Two cases of familial schizencephaly were described in Somalia but still no FCD [30]. So to the best of our knowledge, this is the first report of FCD as a cause of epilepsy in an adult patient in sSA. This might be mainly due to technical limitations as availability and utilization of MRI units across sSA remains poor. Ogbole et al identified a total of 84 MRI units for a combined population of 372,551,411 in West Africa (0.22 per million population). Most of these were low field strength system [31]. Comparatively, Japan reports 51.67 MRI units per million population [31]. Furthermore, FCD lesions (particularly type I) may occasionally remain invisible on standard MRI sequences thus requiring advance techniques such as fluorodeoxyglucose-positron emission tomography FDG-PET, magnetoencephalography (MEG) and diffusion tensor imaging (DTI) all of which are scarcely available on the African continent [8] .

African adult neurologists might equally not be proned to considering FCD's as these mostly express themselves in the paediatric population. Onset of seizures due to FCD has been described up to 60 years old [32] and our patient was 46 at onset of the seizures, falling within the range. MCD represent the second cause of drug resistant epilepsy after hippocampal sclerosis in the adult population. They generally have a favourable prognosis after surgery [8]. Our patient is however seizure-free on a single antiseizure medication thirty-three months after initiation of treatment. This pharmacosensitivity represents an infrequent evolution in FCD as up to 76% of patients with FCD develop drug resistant epilepsy [32]. Nevertheless, a long term follow-up will be necessary in this patient as Fauser et al. reported a transient drug response (defined by the absence of seizures on antiseizure medication for [?] 1 year) in 17% of a cohort of 120 patients with FCD [33].

The present report presents several limitations. It is a single retrospective case report without the long term video-EEG confirmation of ictal coughing. The low resolution of MRI and EEG images (which could not be displayed in other montages) equally represent a major drawback.

CONCLUSION

This report aims at raising awareness of clinicians and radiologists practicing in sSA on rare forms of epileptic seizures. Epilepsy should be considered as a differential diagnosis of paroxysmal stereotyped events including

cough even in the absence of typical motor symptoms. FCD should be considered as a possible cause of epilepsy in adults presenting with focal seizures, particularly those with normal CT scans. Diagnosis of FCD will therefore require more available and affordable MRI units for sub-Saharan African populations.

Ethical statement

The patient signed an informed consent form agreeing to publication of the manuscript

Conflict of interest

The authors have no competing interests.

Authorship

ESC, OT and HNT received the patient and did the initial management of the patient. ESC and OT wrote the first draft of the case report. LN, LNN, MMK, ELM, FD, YF, GYT, HDAM and AKN discussed the case in a multicentre clinical staff meeting, critically reviewed the initial draft and approved the final version of the manuscript.

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