Partial seizures presenting as *Ictus Emeticus*

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**Abstract**

**Objective:** To study the clinical and electroencephalographic profile of patients diagnosed with partial seizures presenting as *ictus emeticus*.

**Setting:** Neurology service at King Fahd Teaching Hospital (KFHU), Al-Khobar, Saudi Arabia.

**Patients and methods:** Review of all records of patients diagnosed with epilepsy at KFHU between January 1985 and December 1994.

**Results:** *Ictus emeticus* was diagnosed in 3 children, 2 males and 1 female. They all presented with recurrent episodes of vomiting for which the patients were amnesic. Post ictal drowsiness and sleep were uniform. The diagnosis was made on the basis of paroxysmal vomiting without gastrointestinal pathology, patient’s amnesia to the event, absence of structural brain abnormalities revealed by Computerised Tomography (CT) of the brain, epileptic discharges on electroencephalogram (EEG) and favorable response to anti-epileptic drugs.

**Conclusion:** *Ictus emeticus* is uncommon but physicians must be aware of its existence as the symptoms are readily treatable with anti-epileptic drugs.

**Keywords:** *Ictus Emeticus*, vomiting, electroencephalography, epilepsy.

Ictal vomiting as a visceral phenomenon occurs in limited forms of epileptic seizures. Although there is no specific set of criteria for the diagnosis of *ictus emeticus*, the following criteria may help differentiate *emeticus* from other forms of epilepsy:

1. Paroxysmal vomiting without an underlying gastrointestinal pathology.
2. Patient’s unawareness of vomiting.
3. Neurologic symptoms that are not accounted for by structural brain abnormalities revealed on CT scan of the brain.
4. Abnormal EEG showing epileptic discharges.
5. Response to anti-epileptic therapy.

In this study we report 3 patients with *ictus emeticus* that were seen in the epilepsy clinic at King Fahd Hospital of the University (KFHU), Al-Khobar, between 1985 to 1994. The diagnosis for all of these patients was based on the above features.

**Materials and methods** All records of patients with the diagnosis of epilepsy that were seen in the KFHU between January 1985 and December 1994 were reviewed. The KFHU is a referral tertiary care hospital for the entire Eastern Province with a population of 2.3 million. The average number of registered patients seen in the Epilepsy Clinic per year is 989. Three cases were found to fulfill the above criteria for the diagnosis of *ictus emeticus*. The following are brief summaries of them.

**Case 1:** A 7 year old female was admitted to the Pediatric Ward with a 9 month history of stereotyped, recurrent episodes characterized as follows: the child cried or called for her mother with intelligible words followed by maintaining her posture in a sitting or standing position without falling. This was accompanied by intractable vomiting for 3-5 minutes. She then became drowsy and fell asleep for 2-3 hours, awoke inactive, but hypotonic and ataxic. She took about 24 hours to get back to normal. The general medical and neurologic examinations were unremarkable. Investigations, including complete blood count (CBC), erythrocyte sedimentation...
Fig. 1: Frequent epileptic spikes usually followed by slow waves in the mid and posterior temporal head regions.

Fig. 2: Epileptic spike and slow waves in the fronto-central head region.
rate (ESR), liver function tests (LFTs), electrolytes and CT brain (plain) were normal. EEG was abnormal. It showed bilateral temporal epileptic discharges (Fig. 1). She was started on carbamazepine 100 mg po bid. She was followed up for 18 months and during this time had no further attacks.

**Case 2:** A 9 year old, right-handed male presented with a 6 month history of recurrent attacks of sudden screaming associated with projectile vomiting followed by facial and scalp sweating lasting for 2-3 minutes. During the attack the patient was unresponsive but did not lose tone. The attack was followed by lethargy and the patient slept for 2-3 hours. In one episode prior to presentation at KFHU, the patient developed his habitual ictus but this was followed by collapsing with clonic movements of both upper and lower extremities, up-rolling of the eyes, clenching of the jaws, frothy mouth and perioral cyanosis. There was no sphincter incontinence. The general medical and neurologic examinations were normal. The hemogram, coagulogram, serum biochemistry, serum calcium and magnesium were all normal. CT scan of the brain (plain and contrasted) were normal. The EEG showed frequent epileptic discharges in the left front-central head regions (Fig. 2). The patient was started on carbamazepine 150 mg po bid. His last antiepileptic drug levels were within the therapeutic range. Patient remained seizure-free for 23 months.

**Case 3:** A 6 year old female a product of 38 weeks gestation and low segment cesarean section (CS). The CS was performed for premature rupture of the membranes. The birth weight was 2.840 grams with Apgar score of 8 and 9 at 1 and 5 minutes respectively. She had normal developmental milestones. Two months prior to presentation, the patient developed stereotyped recurrent episodes of arrest of ongoing activity with frequent retching and repetition of a few words like "Mama, I am scared". This was usually followed by projectile vomiting for 3-4 minutes. After the attack the patient became lethargic and slept for 3-4 hours. The general medical and neurologic examinations were within normal limits. The hemogram, coagulogram, serum biochemistry, serum calcium and magnesium were normal. CT scan of the brain (plain and contrasted) were normal. Cranial magnetic resonance imaging (MRI) (plain) both T1 & T2 weighted images were normal. The EEG showed frequent epileptic discharges in the left frontotemporal head regions. She was started on carbamazepine 125 mg po bid. She remained seizure-free.

**Discussion** All the patients in this study had recurrent vomiting for which they were amnestic, EEG showing epileptic activity and favorable response to anti-epileptic therapy. *Ictus emeticus* mimics include cyclical vomiting, abdominal epilepsy and abdominal migraine.

Cyclical vomiting is characterized by recurrent bouts of severe vomiting which may be associated with headache, abdominal pain and fever. The etiology is uncertain, but it is considered by some to be representing a variant of migraine. EEG abnormalities are frequent. In a study by Hoyt and Stickler the EEG was recorded in 14 out of 44 patients with cyclical vomiting. Only 4 showed some EEG abnormalities which included paroxysmal and generalized dysrhythmia with rhythmic posterior slow wave discharges in one.

Abdominal epilepsy is characterized by recurrent abdominal pain with or without vomiting, excessive salivation or sweating, incontinence and borborygmi. The patients are not amnestic to the episode. There are no typical EEG abnormalities that characterize abdominal epilepsy. De Lorenzo indicated that the EEG in abdominal epilepsy shows bilateral, symmetrical and synchronized discharges usually consisting of spike and wave, polyspikes and flattening with low voltage pattern.

Children with typical abdominal migraine have a positive family history in 70-90% of cases and the EEG shows no epileptic activity.

It is notable that the onset of symptoms in the patients of the present study ranged from 6 years to 9 years with one female and 2 males. This is consistent with the predominant occurrence of the condition within the first 2 decades of life. All of these patients had shown ictal phenomena prior to vomiting, followed by impairment of consciousness and ictal vomiting. All patients were amnestic to the episode. Kramer et al reported that 8 out of 9 patients studied were amnestic to the episode. In all of our patients the post-ictal period was marked with lethargy and sleep. This was the observation of other investigators as well. Kramer reported that one of his patients regained normal alertness immediately. The EEG abnormalities in all of our patients were isolated sharp and sharp and slow epileptic discharges predominating over the fronto-temporal head regions. These findings corroborate the observations previously noted.

Photosensitivity has been shown in some patients with *ictus emeticus*. This was not the case in the present report.

Vomiting is a complex phenomenon mediated by the vagus nerve and coordinated in the dorsal
lateral reticular formation at the level of the olivary nuclei known as “vomiting centers”. These “centers” are influenced by descending cortical and limbic pathways through the forebrain bundle, the dorsal longitudinal fasciculus, the fasciculus retroflexus and descending fibers involved with mamillotegmental tract.14 However, the underlying pathophysiological mechanisms for ictus emeticus are not clear. What is known is that the epileptic activity in patients with ictus emeticus and complex partial seizures usually arise in the temporal lobe, insular cortex and/or limbic structures such as the amygdala.4,5,13,15 The descending influence of these structures may trigger the vomiting reflex.

Recently, resection of a left temporal lobe tumor with preservation of the amygdala and hippocampus permanently abolished ictal illusions in a 20 year old man suggesting that the temporal lobe neocortex may be, in some patients, the only source of ictal activity.16 Involvement of the paleo-spinothalamic system with its limbic connections was also suggested as a possible mechanism.17

Whatever the underlying mechanisms may be, ictus emeticus is uncommon. It is important for physicians to be aware of it, when dealing with patients who present with recurrent vomiting of non-gastrointestinal origin. An abnormal EEG and an amnesia to the event will help establish the diagnosis of this treatable condition.

References

المتخصصة:
الأهداف:
دراسة سريرية وتسجيلية دماغية للمريض المشحذين كحالات صرع جزئية كنوبات قلبية.
المكان:
قسم الأعصاب بمستشفى الملك فهد الجامعي بالخبر - المملكة العربية السعودية.
المعضوي والطرق:
تمت دراسة جميع ملقات المرضى بالنوبات الصرعية بمستشفى الملك فهد الجامعي في الفترة ما بين يناير 1995م إلى ديسمبر 1994م.
النتائج:
تم تشخيص النوبات القلبية في ثلاث أطفال ذكور، واحدة. كانت أعراض الثلاثين الفقى المتكرر مع عدم التذكير لحالة الفقى بعد إنقراضها والنزاع والنوم بعد النوبات. تم التشخيص بناءً على وجود النوبات القلبية المتكررة بدون أسباب مرضية بالجهاز الوعائي، عدم تذكر وقوع نوبات القلب، عدم وجود علامات مرضية بالدماغ بالأشعة المقطعتبة، وجود نشاطات صرعية بالتشخيص الكهربائي الدماغي تم الاستجابة للعفائر المضادة للصرع.
المتخصصة:
يعتبر الفقى الصرعي من الحالات غير الشائعة التي ينبغي أن يأخذها الأطباء في الإعتبار لإمكانية علاجها بمضادات الصرع.