CASE REPORT

Yawning as the Presenting Feature of a Complex Partial Seizure

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ABSTRACT

Yawning as the presenting feature of complex partial seizures is an extremely rare phenomenon. We report a 37-year-old female who presented with spontaneous attacks of yawning and stretching, which were controlled by the anticonvulsant carbamazepine. Spiral brain CT scan and MRI were unrevealing. The relevant literature is summarized and the proposed mechanisms of anomalous yawning are addressed. Biomed. Int. 2011; 2: 90-93. ©2011 Biomedicine International, Inc.

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INTRODUCTION

Yawning is a physiological and stereotyped event characterized by a coordinated array of facial, masticatory and respiratory movements.1 It is concomitant with increased cortical electroencephalographic activity.1 In humans, yawning entails four phases: mouth gaping, long inspiration, brief pause and finally rapid expiration.1,2 Several medical etiologies have been suggested, and yawning can also be triggered by drugs or by psychological, hormonal and neurological stimuli.1-10 Notably, Goldie and Green mentioned that yawning occurs more frequently in a state of cerebral stimulation than during periods of silence and inactivity.11

Yawning and stretching in the context of an epileptic diathesis is presumably a rare phenomenon since only few cases have been described in the literature.11-13 This clinical scenario could be the presenting feature of an infantile spasm or a possible aura of epileptic seizure.11,12,14 We report a rare case of complex partial seizures manifested by spontaneous yawning and stretching in a young woman. A brief review of the literature is presented and the possible underlying mechanisms of anomalous yawning are discussed.

CASE REPORT

A 37-year-old female from a rural area (East Azerbaijan, Iran) was brought to the emergency department in an unconscious state with recurrent spontaneous yawning and
stretching. Past medical history revealed an onset of neck pain and spasms for three days and a history of common cold two weeks earlier. After approximately 30 minutes in the emergency room her yawning ceased and she gradually regained consciousness, though she remained slightly confused. An emergent spiral brain CT scan showed no brain lesions. With the diagnosis of status epilepticus, the patient was admitted for further evaluations and treatment. On admission, physical examination revealed a woman who was lethargic and in no acute distress. Blood pressure was 125/80 mmHg and pulse rate was 88/min. Respiratory rate and body temperature were 21/min and 37.2°C (axillary), respectively. The patient continuously yawned with simultaneous shoulder and elbow extension, wrist, hip and knee flexion and spinal extension. Neurological examination demonstrated generalized muscle weakness (muscle strength 4/5) and non-responsive plantar reflexes. Muscle tone was increased in the right upper and lower limbs. Deep tendon reflexes were 2+ and symmetric. The patient had dysesthesia of the right upper and lower limbs in the form of a pins and needles sensation with fine touch stimulation. No signs of meningeal irritation were found. Cranial nerves were grossly intact.

During the afternoon (4:30 p.m.) of the second day after admission, the patient had an episode of epigastric pain. After 5-10 minutes, she suddenly became unconscious with no response to painful stimuli. At this time, her eyes closed, her jaw became locked and her gaze deviated toward the right. Ten minutes thereafter, she developed facial flushing, lip smacking and forward chin movement. Then she snorted for about five minutes. This was followed by recurrent (7-9 times) yawning associated with head rotation and neck deviation to the right, right shoulder and elbow extension and wrist flexion, left shoulder, elbow and wrist flexion, and lower limb and spinal extension. This attack lasted for approximately 50 minutes and then the patient gradually regained consciousness. During the post-ictal phase (lasting 20 minutes), the patient had urgency but no incontinence. Carbamazepine was prescribed and the patient had no seizures thereafter. Inter-ictal EEG showed generalized dysrhythmia and slowness. Three days after admission, anticonvulsants were discontinued and the patient had another attack of epileptic yawning as described above. A brain MRI was unrevealing. Anticonvulsant medications were started and the seizures again subsided.

**DISCUSSION**

The association of yawning with human diseases has a rich history, as indicated by the medical writings of Hippocrates, Galen, Avicenna and Rhazes. Avicenna regarded any unintentional movement of voluntary muscles as a kind of seizure. Darwin, in his “Expression of the Emotions in Man and Animals”, mentioned yawning as an expression of passion. Perhaps the first observation of an association between yawning and seizure was made by Sir John Russell Reynolds, a British neurologist; he described a prolonged phase of yawning and drowsiness preceding generalized clonic seizure attacks in a 20-year-old man. Sir William Richard Gowers, another British neurologist and a friend of Reynolds, described nausea and retching in 14 epileptic patients, associated particularly with giddiness and involving the gastric division of the vagus nerve. Goldie and Green also reported three young girls with petit mal epilepsy and yawning. They found that yawning occurred frequently during the onset of electrical spike and wave attacks. Flechter and coworkers reported a woman with yawning and headache as the manifestations of a diencephalic seizure. Post-ictal yawning has also been reported in a woman with non-dominant hemisphere epilepsy. Attacks of yawning and screaming have been noted in a
male infant with hydranencephaly; this was initially controlled by phenobarbital, but later complicated by myoclonic jerks.\textsuperscript{18}

In the present case, the paroxysms of yawning and stretching were controlled by the anticonvulsant carbamazepine. Surprisingly, most of the recent reports of yawning in epilepsy, described above, occurred in female patients. The significance of this finding is not clear and the predilection for women of this rare manifestation needs further elucidation. It has been suggested that yawning is an androgen-dependent behavior and is under similar control in both males and females.\textsuperscript{19} Studies have shown no gender difference in the frequency of non-pathological yawning in humans.\textsuperscript{20}

Topper and coworkers suggested that yawning is associated with an emotional motor system with an independent input to the motor neurons in the brain stem and the spinal cord;\textsuperscript{21} this explained the yawning and stretching movement observed in the plegic arm. Argiolas and Melis hypothesized that oxytocinergic neurons originating in the hypothalamic paraventricular nucleus and projecting to the hippocampus, pons and medulla oblongata mediate yawning.\textsuperscript{1} Dopamine, serotonin, acetylcholine, nitric oxide, noradrenaline and gamma-aminobutyric acid are also involved in this pathway. Intracerebral injection of adrenocorticotropic hormone has been shown to induce classic yawning-stretching behavior in animals.\textsuperscript{9,22}

Taken together, yawning-stretching is a complex behavioral phenomenon. The weight of current evidence suggests that in humans and some other mammals, yawning is part of the repertoire of empathic and social skills and specifically conveys drowsiness, boredom, or mild psychological stress.\textsuperscript{15} However, its dysregulation, as seen in the case described here, indicates an underlying disorder;\textsuperscript{24} examples include thermoregulatory abnormalities,\textsuperscript{25} for example in multiple sclerosis.\textsuperscript{16} We emphasize that the clinician should also consider yawning as a possible presenting feature of various types of seizure.

REFERENCES