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(CASE REPORT)

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Laughter-Induced Syncope: A rare subtype of situational reflex syncope: A case report

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Abstract

Background: Syncope is a common clinical presentation at medical facilities, often challenging to diagnose due to its diverse etiologies. Laughter-induced syncope (LIS) is a rare, under-recognized variant of syncope, triggered by intense laughter. While generally benign, it may be misdiagnosed as seizure or cardiac syncope without careful history-taking.

Case Presentation: A 35-year-old woman presented with recurrent brief episodes of loss of consciousness exclusively precipitated by sustained laughter. Each episode lasted approximately 30 seconds with no tonic-clonic movements, incontinence, or postictal confusion. Episodes were self-limited with spontaneous, complete recovery. Past medical history and family history were all unremarkable. Physical examination, laboratory investigations, electrocardiography, echocardiography, and electroencephalography were all normal. Alternative causes, including cardiac arrhythmias, structural heart disease, seizures, metabolic disturbances, and cataplexy, were excluded.

Discussion: LIS likely results from a combination of increased intrathoracic pressure during vigorous laughter, transient reduction in venous return, reflex-mediated bradycardia or vasodilation, and subsequent cerebral hypoperfusion. Diagnosis is clinical, relying on detailed patient history and witness accounts, with exclusion of alternative causes. Management is primarily conservative, focusing on patient education, avoidance of prolonged intense laughter, and reassurance regarding the benign nature of the condition and its prognosis.

Conclusion: This report highlights the importance of systematic evaluation and careful history-taking in assessing transient loss of consciousness. Recognition of LIS prevents unnecessary investigations, facilitates accurate and timely diagnosis and provides reassurance to patients and their families on the benign nature of the condition. It also raises awareness among clinicians particularly in differentiating reflex syncope from potentially serious causes of transient loss of consciousness.

Keywords: Laughter-Induced Syncope; Situational Syncope; Reflex Syncope; Transient Loss of Consciousness

1. Introduction

Syncope is defined as a sudden, brief loss of consciousness due to transient global cerebral hypoperfusion, associated with postural collapse and spontaneous recovery. It accounts for approximately 1–3% of emergency visits and hospital admissions (1). Data on the lifetime prevalence of syncope in developing countries like Tanzania are limited, but in developed nations, it ranges between 20–40%, with peak incidence in adolescence and older age (2, 3). Characteristic prodromal features of syncope include dizziness, nausea and sweating, which may serve as warning signs. Although generally benign, syncope carries risks of trauma and, in some cases, may indicate a life-threatening cardiac condition (4).

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The etiologies of syncope vary widely but they can be broadly classified into four main categories: Reflex syncope that result from disorders of autonomic nervous system, orthostatic hypotension, cardiac syncope, and cerebrovascular syncope. Additionally there are other conditions which may mimic syncope but are not caused by transient cerebral hypoperfusion such as seizures, hypoglycemia, cataplexy, hypoxia and psychogenic disorders. (1–4).

Reflex syncope includes vasovagal syncope, carotid hypersensitivity and situational syncope. Vasovagal (neurocardiogenic) syncope is the most common type and is often triggered by prolonged standing, standing in crowded environment or emotional stress such as witnessing trauma. The second most common cause of syncope is postural (orthostatic) hypotension which may result from medications (such as alpha blockers, vasodilators etc.), autonomic dysfunction (as seen in diabetes mellitus, autoimmune conditions, vitamin deficiencies etc.), or hypovolemia (1, 2). Other causes of reflex syncope include carotid sinus hypersensitivity and situational triggers such as coughing, micturition, and laughing, and rarely glossopharyngeal neuralgia (5).

Cardiovascular causes include arrhythmias and structural or mechanical cardiac abnormalities, while cerebrovascular disorders such as vertebrobasilar insufficiency and basilar migraine are less frequent (1, 2, 6).

Laughter-induced syncope (LIS) is a rare subtype of situational syncope. Although documented in literature, it remains under-recognized and may be misdiagnosed without careful history-taking (6). The following case illustrates typical clinical features of LIS, emphasizing the diagnostic value of a detailed patient history and physical examination in addressing medical conditions.

2. Case Presentation

We are reporting a 35-year-old woman who presented at Dr. Ole Lengine's Memorial Hospital outpatient department with one month history of recurrent syncopal episodes triggered exclusively by extreme laughter. The first episode occurred during a family gathering, following a deep, sustained laugh lasting approximately two minutes. Observers reported a brief loss of consciousness lasting approximately thirty seconds. Recovery was immediate and complete, with no postictal confusion, chest discomfort, palpitations, or dyspnea.

Two similar prior episodes were reported under identical circumstances. Witnesses who were present during the episodes confirmed the absence of muscle jerks, abnormal movements or frothing at the mouth. She denied syncope related to physical exertion, emotional stress, or changes in posture, she described only mild lightheadedness immediately before the onset of syncope. There was no history of limb weakness, pin and needles sensation in any part of the body, swallowing difficulties, diarrhea, vomiting, significant weight changes, difficulty in breathing, cough, easy fatigue, lower limb swelling, chest pains, palpitations or night sweats, In addition she had no history of fever, blurred vision, loss of vision, malaise, cold or heat intolerance, joint pains, joint swelling, skin lesions, genital ulcers or abnormal vaginal discharge.

Her past medical history was unremarkable; she had no cardiovascular disease, hypertension, diabetes, seizures disorders, and stroke or head trauma. She took no chronic medications and had no allergies. Family history was negative for sudden cardiac death, arrhythmias, epilepsy, or syncope. There was no family member with similar history. She is a housewife, married, and reported no psychiatric illnesses in the family. She had no history of using alcohol or illicit substances.

On examination, she appeared well with stable vital signs (BP 115/75 mmHg, HR 80 bpm, SpO_2 98% on room air). Cardiovascular and neurological examinations were unremarkable, with no murmurs, focal deficits, or signs of autonomic dysfunction. Orthostatic blood pressure measurements showed no significant changes.

Several laboratory investigations were performed including complete blood count, serum electrolytes, renal and liver function tests, thyroid panels and fasting glucose and were all within normal ranges. Cardiac enzymes were also normal. Electrocardiography demonstrated normal sinus rhythm without conduction abnormalities. Echocardiography confirmed normal cardiac chambers and valves in structure and functions with preserved systolic function and normal diastolic function. Electroencephalography and brain MRI performed at a nearby referral hospital were also normal. The diagnosis of laughter-induced syncope was established after exclusion of other causes.

The patient and close family members were counseled on the benign nature of LIS and advised on preventive strategies, including early recognition of prodromal symptoms, adopting protective postures (sitting or lying down during prolonged laughter), and implementing fall precautions.

3. Discussion

This patient's clinical features illustrate classic presentation of LIS. Her episodes were brief lasting approximately thirty seconds, self-limited, and occurred with a minimal prodrome of only lightheadedness, consistent with the literature (2, 4, 6). The absence of postictal confusion, tongue biting, incontinence, or abnormal movements distinguishes these episodes from seizures and support syncope due to transient cerebral hypoperfusion.

The pathophysiology of LIS involves a combination of hemodynamic and autonomic mechanisms. Vigorous laughter increases pressure within the thorax thereby reducing venous return to the heart and subsequently lowering cardiac output and cerebral perfusion. Reflex-mediated vasodilation and/or bradycardia, similar to mechanisms in vasovagal syncope, may exacerbate hypotension, leading to brief loss of consciousness (3, 6). In this patient, her deep, sustained laughter likely augmented intrathoracic pressure, triggering the syncopal episodes.

The diagnostic process highlights the principle of exclusion. Normal electrocardiogram, echocardiography, and neurological examinations were essential in ruling out arrhythmic and structural heart diseases, which are common in developing countries - where Valvular heart disease remains the leading cause of heart failure in young adults. Additionally laboratory tests excluded metabolic causes such as thyroid related disorders (1, 6). These findings reinforce the importance of thorough evaluation and careful interpretation of witness observations.

In managing patients is also important to differentiate LIS from neurological conditions such as cataplexy, a symptom of narcolepsy in which laughter can trigger sudden loss of muscle tone without loss of consciousness. In this patient, a true loss of consciousness was experienced, confirming LIS and excluding cataplexy (4).

Management of this condition is predominantly conservative. Education on identifying prodromal signs and minimizing prolonged intense laughter is central. Reassurance regarding the benign nature of LIS is essential, and prognosis is excellent. Rarely, autonomic testing or ambulatory monitoring may be indicated if episodes are frequent, injurious, or atypical (1, 3, 4, 6).

4. Conclusion

This case underscores the importance of integrating detailed clinical history, witness accounts, and systematic exclusion of alternative etiologies in syncope evaluation in a hospital setup. Recognition of laughter-induced syncope, though rare, can prevent unnecessary investigations, guide conservative management, and reassure patients about the benign nature of this condition. It also raises awareness among clinicians particularly in differentiating reflex syncope from potentially serious causes of transient loss of consciousness

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that there are no competing interests in this work. No funding was provided by any financial or academic institution for this case report. No conflict of interest to be disclosed.

Statement of ethical approval

The ethical clearance for our study was sought.

Statement of informed consent

A written informed consent was obtained from the patient for case reporting and anonymous publication. Confidentiality was guaranteed.

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