Recurrent Laughter-induced Syncope

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Introduction: Syncope is a common presenting complaint in Neurology clinics or Emergency departments, but its causes are sometimes difficult to diagnose. Apart from vasovagal attacks, other benign, neurally mediated syncopes include "situational" syncopes, which occur after urination, coughing, swallowing, or defecation.

Case Report: A healthy 42-year-old male patient presented to the neurology clinic with a long history of faints triggered by spontaneous laughter, especially after funny jokes. Physical and neurological examination, and electroencephalography and magnetic resonance imaging were unremarkable. There was no evidence to suggest cardiogenic causes, epilepsy, or cataplexy and a diagnosis of laughing syncope was made.

Conclusions: Laughter-induced syncope is usually a single event in the majority of cases, but may present as recurrent attacks as in our case. Some cases occur in association with underlying neurological conditions. Prognosis is good in the case of neurally mediated attacks. Laughter may not be recognized by physicians as a cause of syncope, which may lead to unnecessary investigations or misdiagnosis, and affect patients' quality of life.

Key Words: syncope, laughter, situational, neurally mediated

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Syncope is a common presenting complaint in Neurology clinics or Emergency departments, but its etiology can be difficult to determine. Even if the cause is benign, recurrent syncope can result in injury and provoke substantial anxiety among patients and their families, and may lead to extensive investigations by the treating physicians. Apart from vasovagal attacks, other benign, neurally mediated syncopes include "situational" syncopes, which occur after urination, coughing, swallowing, or defecation. Laughter can be a rare cause of situational syncope, but may not be recognized as such by physicians. Here, we present a case of recurrent syncope provoked by laughter.

CASE REPORT

A healthy 42-year-old, right-handed, man was seen in a general neurology clinic with recurrent episodes of loss of consciousness. The first episode occurred 17 years earlier while laughing. A year later, a particularly funny joke triggered spontaneous heavy laughter followed by another brief episode of loss of consciousness. He suffered similar episodes ever since, where he would pass out after spontaneous, unrestrained, heavy laughter, but not after self-induced, simulated laughter. Most of these events were witnessed and were stereotyped in presentation. There was no preceding chest pain, shortness of breath, or palpitations. He always lost consciousness for a few seconds, without warning and without associated movements, except some mild, nonsustained twitching of his limbs seen in the last attack that lasted 15 seconds. There was no history of tongue biting or urinary incontinence. Recovery was always immediate without associated symptoms.

There was no personal or family history of abnormal movements or behavioral arrest to suggest seizures, or of excessive daytime sleepiness, sleep attacks, loss of muscle or postural tone, sleep paralysis, or hallucinations to suggest narcolepsy or cataplexy. The attacks were not triggered by any emotion other than laughter. He was not on any medication and his social history was noncontributory. General neurological examination was unremarkable except for a long-standing left-sided conductive deafness. There were no orthostatic blood pressure changes. Respiratory and cardiovascular examinations were normal, with a resting heart rate of 85 beats per minute. Routine blood tests, electrocardiography, electroencephalography, and magnetic resonance imaging/brain did not reveal any abnormalities.

DISCUSSION

We present a case of recurrent laughter-induced syncope. Since the description of laughing syncope by Cox et al,[1] only 15 other cases of laughing (or gelastic) syncope have been published in the literature to the best of our knowledge.[2–14] Most cases were neurally mediated syncopes triggered by laughter[2–4,6,7,10,12,13] similar to our case. Two individuals had attacks of near syncope only.[12,13] Laughter-induced syncope was a single event in most individuals,[1,2,4–7,9,10,13] with only 2 previously reported cases having multiple episodes of laughing syncope.[8,13] A few cases had multiple syncopes also triggered by coughing, defecation, or micturition.[3,12] Five cases occurred in people with an underlying neurological condition.[1,5,9,11,14] One patient had severe brachiocephalic trunk stenosis with attacks accompanied by transient monocular blindness that disappeared after vascular stenting[1]; 1 had Takayasu arteritis with marked narrowing of the bilateral common carotid and subclavian arteries that resolved after a revascularization procedure[14]; another had lacunar pseudobulbar palsy with attacks triggered by spasmodic laughter managed with bisoprolol[10]; and 1 had a cerebellar ependymoma with syncopal attacks after episodes of pathologic laughter that responded to tumor resection.[9] A girl with Angelman syndrome had multiple episodes of asystole and syncope during outbursts of laughter attributed to vagal hypertonia; intravenous administration of atropine abolished asystole induced by laughter.[5]

Situational syncopes constitute about 5% of all causes of syncope and belong to the neurally mediated or reflex syncopes, with vasovagal (or neurocardiogenic) syncope being the most common, accounting for 18% to 21% of cases.[15,16] Importantly, neurally mediated syncope is considered a benign condition with a good prognosis and no increased risk of mortality, in contrast to cardiac, neurological, or unknown causes of syncope that carry a high and intermediate risk,

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respectively.[16] In a large retrospective series of 641 patients with syncope and presyncope, who had previously been screened for cardiac, neurological, and metabolic disorders that had largely been excluded, only 2 patients were found to have a cough-induced or laughter-induced syncope, but details on these patients were not presented.[17]

Laughter has been associated with forceful, sustained bursts of forced expiration leading to a sudden and substantial decrease in the lung volume and increase in the intrathoracic and intra-abdominal pressure.[18] The pathophysiology of laughter-induced syncope is thought to be analogous to cough (tussive) syncope or other types of syncope associated with increased intrathoracic or intra-abdominal pressure by a Valsalva mechanism.[3,4,6,8] These events are usually associated with increases in the central and cerebral venous pressure, reduced cardiac output, transiently elevated intracranial pressure, and reduced cerebral perfusion.[19,20] The reductions in cerebral blood flow are significantly more marked in people with cough syncope, including reversal of intracranial blood flow during diastole, in comparison with healthy subjects.[20] Impaired sympathetic activation during the Valsalva maneuver has also been suggested as the most likely cause for laughter-induced syncope.[3] The reflex mechanisms involved in neurally mediated syncope may contribute to syncope in cases with extracranial cerebrovascular disease,[1,14] where an increase in the intrathoracic pressure may compromise the blood flow and cerebral perfusion further. The mechanism in cases with central nervous system involvement[5,9,10] is not known.

Evaluation for neurally mediated syncope after initial assessment is usually by tilt testing. Tilt table testing performed in the cases of laughing syncope is usually positive.[3,7,8,13] Recording of cardiovascular changes during a laughing syncope has yet to be performed, but an asymptomatic blood pressure decrease of >20 mm Hg during laughter has been reported in an individual with a single episode of laughing syncope.[13]

No specific treatment is established for laughter-induced syncope. In cases where syncope occurs rarely or under exceptional circumstances in an otherwise healthy person, patient and family education, and avoidance of any other contributing factors (such as dehydration, alcohol, hyperventilation, or vasodilators), and instructions for the patient to curtail laughter or lie down at onset of prodromal symptoms, should suffice. High-risk patients may require pharmacological treatment for recurrent neurally mediated syncope. One reported case was successfully managed with propranolol and midodrine,[8] and another one by bisoprolol.[11] Other cases may respond to treatment of the underlying condition.[1,9,14]

Laughter-induced syncope can be misdiagnosed as cataplexy.[21] However, cataplexy is not associated with loss of consciousness; attacks are precipitated by strong emotions, including laughter, anger, excitement, or surprise, and usually occurs in association with narcolepsy.

In conclusion, laughter is a rare cause of situational syncope with only a few cases described in the literature. Our case is unusual as the subject suffered recurrent attacks, which had not come to medical attention for many years. Most people seem to have single attacks that might explain the small number of reported cases, as sufferers may not seek medical advice. Cases of laughing syncope—particularly those with recurrent attacks—may have an underlying neurological or cerebrovascular condition that needs to be identified and treated. Laughter may not be recognized by physicians as a cause of syncope, which may lead to unnecessary investigations or misdiagnosis, and affect patients' quality of life. We believe that increased awareness of the condition may help the prompt diagnosis of more cases and patient management.

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