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Ictal asystole as primary presentation of seizure: A case report

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Abstract

Background: Ictal Asystole (IA) is a rare but serious condition associated with epilepsy, characterized by a cessation of ventricular complexes for more than 4 seconds during a seizure. This case report highlights the importance of considering IA in patients presenting with unexplained syncope and seizure-like activity.

Case presentation: A 51-year-old male nurse, with no prior history of epilepsy, presented with a single episode of fit-like jerking activity of all four limbs, lasting for 15 seconds, accompanied by urinary incontinence. This was followed by a loss of consciousness and postural tone, resulting in a fall and loss of pulse, necessitating cardiopulmonary resuscitation for 2 minutes. Initial cardiac assessments were unremarkable.

Subsequent investigations included Holter ECG monitoring, echocardiography, electroencephalography and MRI brain. The Holter ECG and MRI revealed no abnormalities, but the EEG displayed generalized epileptic discharges. The patient experienced a second similar episode within two weeks.

Discussion: This case emphasizes the crucial connection between neurological and cardiovascular events in seizure-related syncope. The patient's presentation, with no prior history of epilepsy and normal initial cardiac evaluations, posed a diagnostic challenge. Continuous monitoring and EEG were pivotal in identifying the ictal origin of the syncope.

Conclusion: This case report highlights the importance of a multidisciplinary approach in the evaluation of unexplained syncope, incorporating both cardiac and neurological assessments.

Introduction

Ictal Asystole (IA) is a rare event seen in temporal lobe epilepsy, characterized by epileptogenic activity followed by a pause in ventricular complexes for over 4 seconds. It is thought to occur when brain stimulation affects heart activity via vagal pathways, causing a "vagal storm" that leads to ictal asystole and bradycardia. This cardiac failure results in reduced cerebral perfusion, causing syncope and ending the seizure. The interval between the seizure onset and asystole supports this theory [1].

Epileptic episodes frequently involve cardiac arrhythmias. Around 80% are linked to temporal lobe epilepsy, with the rest to extratemporal lobe seizures. Ictal Tachycardia (IT) makes up 80% to 100% of these arrhythmias, while Ictal Bradycardia (IB), defined by an R-R interval over 2 seconds, occurs in fewer than 6% of cases [2]. However, bradycardia can be so extreme as to result in asystole, followed by loss of consciousness.

Seizure-related syncope is rare. It involves a brief, reversible

loss of consciousness and postural tone, with causes including neurological, cardiovascular issues, or epilepsy. Features of ictal syncope include sudden drop attacks, loss of awareness, behavioral arrest, a blank stare before atonia, and postictal confusion distinct from situational disorientation [3].

Changes in cardiac rhythms often occur during seizures. When an EEG shows epileptic discharge along with bradycardia and syncope, it is often called ictal bradycardia syndrome or ictal syncope [4].

Ictal asystole raises the risk of Sudden Unexpected Death in Epilepsy (SUDEP). The patient's presentation underscores key aspects of diagnosing and treating IA.

Here, we present a case of 51-year-old male nurse with ictal asystole followed by syncope.

Case presentation

A 51-year-old male nurse with no medical history, nonsmoker and nonalcoholic, presented after a single episode of jerking in all four limbs for 15 seconds associated with urinary incontinence. He lost consciousness and postural tone, falling while on duty in an operating theater. He had no pulse and received CPR for 2 minutes, restoring his pulse and consciousness. There was no focal neurological deficit. Cardiac assessment, including troponin levels and ECG, was unremarkable.

In the neurology OPD, he underwent Holter ECG, echocardiography, EEG, and MRI of the brain. The Holter ECG showed normal sinus rhythm with an average heart rate of 76 bpm over 48 hours. Echocardiography was unremarkable. MRI with contrast noted no evidence of infarction, intracranial hemorrhage or mass effect (Figures 1,2).

However, the EEG demonstrated generalized epileptic discharges (Figure 3).

A few days later, the patient had a second episode of jerking followed by a 5-minute loss of consciousness while in the chest pain unit at his workplace.

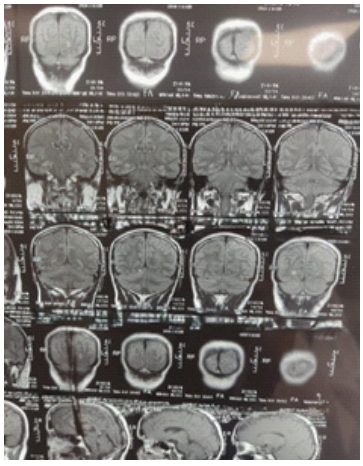

Figure 1: Clinical image.

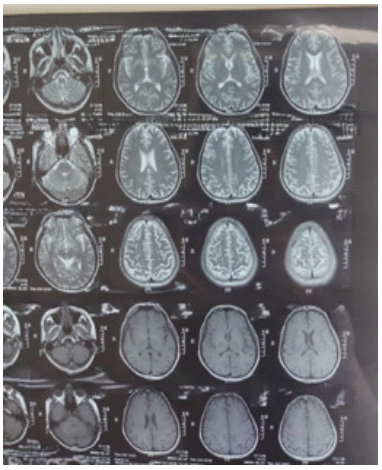

Figure 2: Clinical image.

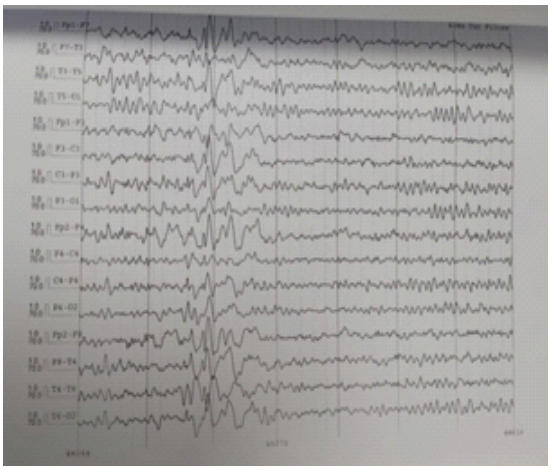

Figure 3: Clinical image.

Discussion

This case highlights the important link between neurological and cardiovascular events. Unlike many cases with a known epilepsy history, this patient had no prior diagnosis of epilepsy before presenting with ictal asystole [5,6].

Li Wenyang et al. identified ictal asystole with isolated syncope as a rare phenomenon which can present as recurrent events that may be the first or the only symptom of epilepsy, therefore, highlighting the importance of considering ictal asystole in differential diagnosis for unexplained syncope [3].

Yehia et al. reported a case of a 50-year-old female with well-controlled temporal epilepsy and a 20-year seizure-free period who experienced sudden drop attacks with brief loss of consciousness, postural tone, and urinary incontinence. Her clinical examination, biochemical profile, and MRI were unremarkable. Continuous ECG monitoring revealed an asystole episode lasting ~20 seconds, followed by sinus bradycardia, but her EEG showed no seizure activity. She was diagnosed with isolated symptomatic bradyarrhythmia rather than ictal bradyarrhythmia or seizures. This report highlights the difficulty in differentiating epileptic events, ictal syncope, and cardiac syncope, emphasizing the need for simultaneous EEG and ECG recordings for accurate diagnosis and therapy [7]. Similar investigations were carried out in our case but due to epileptic discharges on EEG, a suspection of Ictal asystole was made.

Systematic reviews performed by Van der Lande et al. and Tenyi D et al. identified that such events of seizure associated with IA, are mostly initiated in the left hemisphere particularly in the temporal lobes [8,9].

Reeves concluded that ictal bradycardia syndrome should be considered in patients with unusual or refractory syncope, or those with a history of both epilepsy and syncope. He also found a link between male gender and seizure onset in the temporal lobe [10].

Ictal asystole, occurring in 0.22-0.4% of seizures, is of interest to both neurologists and cardiologists. It can cause confusion in diagnosis or delay the identification of epilepsy [5].

There are reports that associate IB and IA with an increased risk of Sudden Unexpected Death in Epilepsy (SUDEP) [11,12]. Healthcare professionals, especially in the Epilepsy Monitoring Unit (EMU), must be familiar with ictal asystole to identify and treat it promptly due to its potentially fatal consequences.

Managing IA requires a multidisciplinary approach combining neurology and cardiology. The American Heart Association recommends optimizing antiseizure drugs and considering epilepsy surgery for appropriate candidates. If asystole events persist beyond six seconds despite medication, cardiac pacemaker implantation should be considered [1].

Conclusion

This case underscores the essential interplay between neurological and cardiovascular events in seizure-related syncope, especially in individuals without a prior epilepsy diagnosis. It highlights the importance of considering ictal asystole in the differential diagnosis of syncope, particularly when cardiac evaluations are inconclusive. The case illustrates the diagnostic challenges of distinguishing between cardiac and neurogenic causes of asystole with syncope and stresses the importance of early detection and intervention to prevent fatal outcomes. This emphasizes the need for further research and increased awareness among healthcare professionals in neurology and cardiology.

Consent for publication: Informed consent was taken from the patient for publication.

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