

CASE STUDY

**HOT WATER EPILEPSY: A CASE REPORT AND
LITERATURE REVIEW**

**Pathan Amanulla Khan¹, Neda Fatima², Naureen Fatima¹, Juwerriah
Nishaat¹, B. B. Sarah Nousheen^{1*}**

1. Anwarul Uloom College of Pharmacy, Hyderabad, Telangana, India
2. Salar-e-Millat Sultan, Salah Uddin Owaisi Research Centre for Cellular and Molecular Medicine, Princess Esra Hospital, Hyderabad, India

Correspondence

B.B. Sarah Nousheen*

Department of Pharmacy Practice
Anwarul Uloom College of Pharmacy,
Hyderabad, Telangana, India, 500001

✉ sarahnousheen@gmail.com

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ABSTRACT

Hot Water Epilepsy (HWE) is categorized as an infrequent form of reflex epilepsy where an episode is initiated by a hot water shower. The condition was first reported in New Zealand and has since been described in other parts of the world, with a majority of cases emerging from India. It is most commonly seen in male children. Temperatures between 40 and 50 °C are known to trigger the seizure. However, pathogenesis of the disease is not clearly understood. The present study reports the occurrence of an epileptic episode in a 15-year-old female. The patient portrayed jerky movements of hands and legs on bathing with hot water and was immediately rushed to the hospital. She was administered intravenous fluids, along with injections ceftriaxone, ranitidine and midazolam, tablets paracetamol 650 mg and clobazam 10 mg and a multivitamin syrup. She recovered soon and was discharged thence. The patient was advised to reduce the water temperature especially while taking a head bath.

INTRODUCTION

Reflex epilepsy is a condition in which episodes of seizures can be triggered either by an external stimulus or by an internal mental process. [1] Hot water epilepsy is a variant of reflex epilepsy characterized by seizures during hot water bathing. [2] These events related to bathing can have various causes. [3]

I.M Allen, in 1945, from New Zealand first described a 10-year-old boy who had an episode while bathing. Other case reports followed from Canada, Japan, Australia and the United States. [4] However, a large number of patients with HWE have been reported from India. [5] The mechanism for the generation of reflex seizures is not yet fully understood. [6] Male predominance in such cases is usually observed. [7] Both partial and generalized tonic-clonic seizures, often triggered by temperatures ranging from 40-50°C have been reported.

As in many other types of reflex seizures, the same stimulus triggers either generalized tonic-clonic or partial seizures, suggesting that generalized and localized epilepsies might be influenced by same afferent pathways. [8]

CASE PRESENTATION

A 17-year-old previously healthy female presented with a single episode of seizure, after pouring warm water on her head during bathing. During the episode, the patient portrayed convulsive movements and upward rotation of the eyes without frothing at the mouth. Following the seizure, she was hospitalized immediately.

Family history and past medical history were found to be negative. Height and weight were consistent with age. On examination, her pulse (68 beats/min) and respiratory rates (18 cycles/min) were normal, with a slight elevation in capillary refill time (3 seconds) and decrease in blood pressure (88/60 mmHg). She did not show any signs of pallor, icterus or cyanosis. She was alert and conscious on neurologic examination and portrayed normal reflex responses. Awake EEG was recorded and was found to be normal.

Provocative techniques such as photic stimulation (from 3-25 Hz) failed to provoke epileptic activity, plain and contrast CT scans showed no abnormalities. Laboratory tests such as hematologic and biochemistry reports were within normal ranges. Due to her hypotensive condition, she was started

on intravenous fluids. As per the ILAE, isolated reflex seizures do not necessarily require a diagnosis of epilepsy. However, to prevent possible recurrence, she was prescribed clobazam 10 mg.

Treatment continued until her admission in the hospital, with routine physical examination. Her blood pressure and pulse rate were normal. She had no abnormal cerebellar or meningeal signs. Spine was normal and she was able to appreciate touch and pain in all areas upon sensory examination. She was then advised for discharge and clobazam 10 mg and a multivitamin syrup were her discharge medications. The doctors asked her to use normal temperature water for bathing instead of hot water especially while considering a head bath.

DISCUSSION

Reflex epilepsies account for six percent of all epilepsies [2, 9]. Incidence and prevalence rates may vary, since the occurrence of seizures differs in different age groups. [10] Bebek et al. carried out a study on 21 cases to outline the clinical and electroencephalographic (EEG) features in HWE patients and concluded that males outnumbered females with a ratio of 3:1.

[11] Given its increased prevalence in India, hot water epilepsy is considered to be a geographic epileptic syndrome. [4]

The present case demonstrates hot water epilepsy in a 17-year-old adolescent. Eastern style bathing with hot water poured over the head has been considered a potent trigger for such seizures. However, many other triggers have been reported, such as water of varying temperatures poured over the body, drops of water touching the face or memories linked to bathing. [7] These types of seizures arise from areas of cortical hyper excitability that overlap with regions that are normally activated during specific cognitive, motor and sensory stimulation. [12]

In general, triggers provoking a seizure may differ from one person to another. [9] Identification and avoidance of the specific causative stimuli can be helpful. [13] The pattern of epileptic seizures comprises of 67% of complex partial seizures (CPS) and 33% of generalized tonic-clonic seizures (GTCS). In another study, complex partial seizures and GTCS were reported in 40 and 60% of the patients respectively. [4] Recording was not done in our patient due to the risk associated in provoking such epilepsy. Although bathing epilepsy has

been claimed to be temperature related, its mechanism still remains uncertain. [8] Both tactile and heat stimuli have been considered to be provoking factors in hot water seizures. [14]

A proposed mechanism for the seizure can be defective inhibitory influence over afferent volleys of somatosensory stimuli such as hot water over large body surfaces. [8] Aberrant thermoregulation in genetically susceptible population with possible co-existing environmental influence can be a probable mechanism for this seizure. [15] Seizures may start with a dazed look, sense of fear, vertigo, irrelevant speech, visual and auditory hallucinations, hypotonia, convulsions and cyanosis. [16]

Diagnosis is based on clinical as well as electrophysiological criteria. Video-EEG recording is a critical test to know features of the induced seizures. [17] In the present case, EEG was found to be normal. Mangalore et al. discussed epileptic cases in which diagnosis included the use of a newer non-invasive technique referred to as the EEG-fMRI which showed significant activations in left frontal region in patients. [18] Symptomatic treatment was provided in this case alongside the anti-epileptic drug

clobazam, which is the drug of choice in hot water seizures and is generally taken before bathing. [9] Meghana et al. conducted a study which included 70 patients and concluded that about three-fourth of the subjects were seizure free with intermittent clobazam. [19]

Ullal GR et al. noted the effect of anti-epileptic drug phenobarbitone, which when administered prior to hot water bath, abrogated seizure discharges, indicating its usefulness in hot water epilepsy. However, approximately one-third of patients with the disease continue to have seizures even during regular bathing. [20]

Bidani N discussed an episode of the disease in a pregnant woman who was successfully treated with constitutional homeopathic medications. [21] In the present case, the patient was discharged only after no further episodes were recorded, with clobazam being the discharge medication. In addition, research in this confined area may possibly reveal some underlying pathophysiology of the epileptic phenomena in the brain. [22]

CONCLUSION

Reflex epilepsy is an unusual form of epilepsy with varying triggers. The present case reports hot water epilepsy in a 17-year-

old adolescent. This type of epilepsy may occur in infants, adults and pregnant women. Video-EEG and EEG-fMRI can be utilized for the diagnosis of these seizures. Clobazam is the drug of choice for HWE; depending upon the disease severity, benzodiazepines may also be considered. Avoidance of hot water is the cornerstone of the treatment being offered in this type of epilepsy.

A combination of clinical and geographic studies may be helpful in knowing the prognosis of this rare type of epilepsy. Furthermore, since the exact pathophysiology of the epileptic phenomenon in the brain is unclear, further research in this area may advance the existing pieces of literature.

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