

A Case of Keraunoparalysis: A Bolt from the Blue

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Abstract

Keraunoparalysis is a catastrophic but fortunately totally reversible neuroparalysis of the limbs occurring due to a lightning strike. One such case with transient right hemiparesis along with a brief account of the pathophysiology of this unique neurologic problem has been presented here.

Keywords: Keraunoparalysis, lightning strike, neuroparalysis

INTRODUCTION

Lightning injuries are one of the ancient natural calamities which continue to torment humankind even today. Lightning strike affects multiple systems in the body with a myriad of manifestations. Keraunoparalysis^[1,2] is a benign and completely reversible neuroparalysis following a lightning strike. It commonly affects the lower limbs and gets reversed in few hours. Here, we have presented a case of keraunoparalysis manifesting as acute right hemiparesis following a lightning strike. This case report is an attempt to improve the awareness among the clinicians regarding this unique and totally reversible catastrophic neurological problem seen in the lightning strike.

CASE REPORT

A 51-year-old female was brought to the hospital late in the evening with a history of loss of strength in the right side of the body for ½ h. The patient was roaming inside her house and suddenly knocked off her feet. She complained of loss of strength in the right side of her body along with a feeling of numbness in the affected limbs. There was no history of losing consciousness or seizure. There was no history of diabetes or hypertension. That was a stormy night with flashes of lightning and deafening thunderstorm striking every other minute and the monsoon had just arrived. A deep crack was noticed on one of the walls of the house due to the lightning strike, and pieces of broken window glass found scattered all over the room where the patient had the lightning injury.

On examination

The patient was conscious and could narrate her problems lucidly but appeared terrified. Her vitals were normal, and her oxygen saturation was 98% in the room air. She was afebrile, but the affected limbs felt cold. There were no external injuries or burns on her body. Examination of cardiovascular and respiratory systems was normal. Her peripheral pulses were felt equal and normal on either side. She was fully conscious and oriented with normal cranial nerves though there was a subjective feeling of numbness on the right side of the face. There was right hemiparesis with a power of 2/5 in her lower and upper limbs with hypotonia along with reduced deep tendon reflexes as compared to the left. The plantar reflex was flexor bilaterally. There was a marked impairment of all modalities of sensation on the affected right upper and lower limbs with a subjective feeling of numbness.

Her hemoglobin was 10.5 g/dl; hemogram, metabolic parameters, serum electrolytes, and urine analysis were within normal limits. Her cardiac enzymes were within normal limits, and the electrocardiography showed normal sinus rhythm with no arrhythmia. The chest X-ray and computed tomography scan of the head were normal.

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The patient was managed with 0.9% normal saline and parenteral betamethasone 4 mg 8th h along with ranitidine. The patient made a remarkable recovery over a period of 2–4 h. Her motor weakness disappeared completely with near-normal sensations, except minimal numbness on the affected side. However, she continued to have giddiness and vomited twice. The patient was discharged later after 2 days. A follow-up after a week revealed minimal residual giddiness and numbness in the limbs.

DISCUSSION

Lightning injuries are akin to electrical injuries and have multiple medical consequences. They could affect any system in the body, but, most of the time, nervous system. This is because lightning just like the electricity follows the path of least resistance and the nerves by offering least resistance become most susceptible.^[1] The lightning strike affects the nervous system in total, namely the central, autonomic, and the peripheral nervous system, and the manifestations vary from transient benign symptoms to permanent disability. Several patients do manifest a transient paralysis of the limb muscles called keraunoparalysis. This syndrome is a combination of vascular and neurological manifestations. The involved limbs show neurological symptoms such as total paralysis of the muscles along with varying sensory loss with simultaneous signs and symptoms of vascular insufficiency in the form of pallor, cold, and pulselessness. Fortunately, this nightmare is short lived and benign as the patient recovers quickly and automatically in a period of few hours.^[1-3] The incidence of this kind of acute neurological event could be as high as 80% in the lightning injuries.^[4] However, if there is no recovery, other causes such as spinal cord injury or musculoskeletal blunt injuries should be thought of. The diagnosis of keraunoparalysis is always a retrospective one and by way of exclusion and it comes under Class I manifestations of Cherington's classification of neurological lightning injuries, which is an immediate and transient one.^[5] Keraunoparalysis or Charcot's paralysis usually affects the lower limbs more than the upper limbs.^[2] However, it could be hemiparesis as described by Rahmani *et al.*^[1] and as seen in our patient.

As mentioned earlier, this syndrome involves both vascular and nervous systems. Autonomic nervous system dysfunction is a serious complication of the lightning strike and it results in the release of excessive catecholamine. These catecholamines induce the vascular symptoms such as pallor, coolness, and absent pulses along with ischemia of the peripheral nerves^[1,2,6] by virtue of vasospasm of the limb and spinal arteries. However, our patient, similar to the patient presented by Rahmani *et al.*,^[1] did not have loss of arterial pulsation in the affected limbs. However, it has been found that the limb weakness continues

to be present even after the reappearance of the pulsations of the limb arteries. On the contrary, in some cases, there would be limb weakness with normal limb arterial pulsations as seen in our patient. Another hypothesis which is put forward for the limb weakness is the peripheral nerve reaction to the high current flow through the affected limb where the nerves form the path of least resistance.^[1]

CONCLUSION

Keraunoparalysis is a definitive neurological entity seen in patients struck by lightning and not to be confused with a functional symptom or malingering in the backdrop of neurological symptoms disappearing quickly. A clinical awareness of this benign problem will not only avoid unnecessary therapeutic intervention by the treating physicians but also help to end undue panic and fear in the minds of the victims and their relatives.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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