ISOLATED DEAFNESS DUE TO LIGHTNING STRIKE

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Introduction

Lightning kills several hundred people every year but a much larger number of persons survive lightning bolts. Otolaryngologic injuries are probably much more common than reported cases would suggest [1,2]. The frequent damage is acoustic rupture of the tympanic membrane caused by the sonic shock wave emanating from the axis of the lightning channel. This can occur whether the lightning strikes the person himself or the ground nearby [3]. A case of isolated bilateral sensori-neural deafness without rupture of tympanic membranes following lightning strike is reported because of its rarity.

Case report:

This 27-years-old male in apparently good health was struck by lightning on 10 Mar 97. Patient said that the lightning fell about 15 feet away from him. He was dazed, felt giddy, fell down and sustained a small cut on his forehead. He was unconscious for about 10 minutes and was picked up by his colleagues and taken to the nearest dispensary where he was given first aid. However, from the time he regained consciousness the patient was unable to hear anything. He was admitted to a peripheral hospital and transferred to Command Hospital (Northern Command) for treatment by otologists. There was no history of burns, discharge or bleeding from the ears. There was no history of taking ototoxic drugs, fever, tinnitus, giddiness, hypertension, diabetes or meningitis. There was no past history of head injury, fits, STD or mental disorders. General and systemic examination were within normal limits. ENT examination revealed that nose, throat, preaural region, and external auditory canal were within normal limits. Tuning fork test for malingering was negative. Psychiatric examination was normal.

Investigations: Hemogram, urinalysis, blood sugar (F&PP), liver function tests, VDRL, caloric test and X ray skull periorbital view for internal auditory meatus were within normal limits. Pure tone audiometry done on 22 Mar 97 and 5 Apr 97 showed no response to either air/bone conduction at all frequencies. There was no improvement in hearing with hearing-aid trial. Tympanogram revealed bilateral ossicular disruption. Acoustic reflex showed no response bilaterally.

Discussion

Otic blast injuries occur due to explosions. The explosion causes a pressure shock wave which is the

primary agent of damage. There is often a rupture of the tympanic membrane and there may be ossicular chain injury. Sensorineural hearing loss also occurs and is more common than conductive hearing loss [4]. Flat conductive hearing losses are essentially equivalent to reductions in stimulus intensity in terms of their effects on brainstem auditory evoked potential and are associated with unchanged to slightly decreased inter-peak latencies and increased IV/V: I amplitude ratios [5].

One uncommon cause of this injury is lightning strike. In a review Wright & Silk [3] reported that the average lightning bolt has a current flow of 10-20 KA, lasts 3ms with a peak energy in the first 5-10 μ s generating a temperature of 24,000 C. Six of their seven cases had tympanic membrane rupture which was bilateral in two patients. Five patients had a permanent sensorineural hearing loss [3]. Apart from lack of tympanic membrane injury, the unusual features in our case were that there were no external injuries apart from a small cut on the forehead and no burn injuries. Due to these a functional cause was considered. However organic basis for the deafness was confirmed by brain-stem auditory evoked response.

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