



ORIGINAL RESEARCH PAPER

Radiodiagnosis

COMPUTED TOMOGRAPHY EVALUATION OF RISK OF INTRA-CEREBRAL BLEED POST SNAKE ENVENOMATION

KEY WORDS:

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Introduction

Snakebite envenomation is a common and life-threatening medical emergency seen in tropical as well as subtropical countries. Snakebites are estimated to cause up to 1 lakh deaths each year worldwide and disproportionately affect rural populations in resource-poor settings. Complications set in fast, and the clinician may lose valuable time and the patient unless he or she is careful. In India there are about 216 identifiable snakes in which 52 are venomous. The major snake families being Elapidae (Cobra, King cobra and Kraits), Viperidae (Russell's Viper and saw scaled viper) and Hydrophidae (sea snakes)².

Venomous secretion is more during warmer months than in cold seasons in all venomous snakes. So, the high fatality rate is seen during summer in August, September and October months due to high environmental temperature.

Most snakes inject 10% of the available venom in a single strike except for Russell viper. It injects 75% of the venom in one bite and is responsible for high morbidity and mortality in India³.

Intracerebral haemorrhage is an uncommon but potentially fatal complication of viper envenomation.

Aims and Objectives

The aim of our study was to assess the risk of intracerebral haemorrhage as a complication of vasculotoxic snake bite. The objective was to know the location and distribution of haemorrhages occurring in brain.

Materials and methods

Source of data: The main source of data for this study were patients who presented to casualty of MGM hospital in Kamothe, with history of snake bite, who underwent a CT scan in the radiology department in MGM hospital.

Brief history as provided by the clinician on the CT scan requisition was also included.

Method: A retrospective correlational study was conducted on 10 patients with vasculotoxic snake bite who had received anti snake venom (ASV) and had undergone a CT brain plain scan with Multi-detector Computed Tomography (Toshiba 16 slice CT).

Duration: Study was conducted over a period of 4 months from May 2020 to August 2020.

Protocol: Axial thick cuts 5x5 mm and thin cuts 1x1 mm will be taken from skull base to vertex.

Inclusion criteria

Patients presenting in the tertiary care hospital with recent

history vascular-toxic snakebite. Only those cases who have undergone CT brain plain will be included in the study.

Patients above the age of 18 years.
Both genders were included in the study.

Exclusion criteria

All cases of neurotoxic snake bite.
Patients below the age of 18 years.

Sample size

Total of 10 cases of vasculotoxic snake bite who underwent Computed tomography in tertiary care Hospital of M.G.M's Medical College, Navi Mumbai.

Results

In this study 10 cases of vasculotoxic snake bite who underwent CT scan (brain plain) were studied. Out of these 8 (80%) were males and 2 (20%) were females.

Normal CT brain findings were seen in 7 cases (70%), while abnormal findings were noted in only 3 cases (30%).

The abnormal cases showed hyper dense collections within the brain parenchyma consistent with intracerebral hemorrhage. Among the abnormal cases, 2 of them showed a single lobar hemorrhage while the 3rd case showed multiple lobar hemorrhages involving both cerebral hemispheres

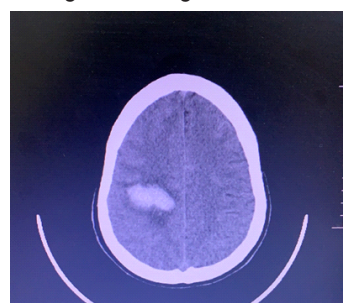


Fig 1: A 45 year old male post snake envenomation 1 week back, with complaints of headache. Intracerebral Hemorrhage is noted in right parietal lobe.

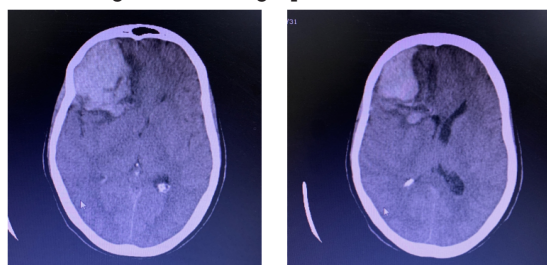


Fig 2: A 48 year old female with history of snake

envenomation 1 day back with dropping GCS. A,B) Intracerebral haemorrhage is noted in right frontal lobe, causing a mass effect on the right lateral ventricle and a mid line shift to the left.

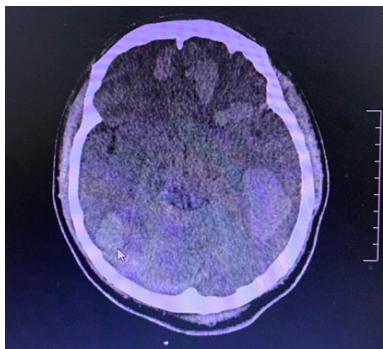


Fig 3: A 23 year old male with history of viper envenomation few hours prior to scan with severe neurological deficit. Multiple lobar haemorrhages were noted involving bilateral frontal parietal and temporal lobes.

Discussion

Ophitoxaemia is rather an exotic term that characterizes the clinical spectrum of snake bite envenomation. In India, Maharashtra has the highest incidence of snake bites (70 snake bites per lakh population), followed by Kerala, Tamil Nadu, Uttar Pradesh, and West Bengal. Mortality due to snake bite is associated with renal failure, central nervous system hemorrhage, and secondary infection. Cerebral complications following snake bite envenomation are rare⁴.

Snake bites by Russell's viper can cause vasculotoxicity, neurotoxicity, or myotoxicity. The usual complications of viper bites mentioned in the literature are local cellulitis, hemorrhagic manifestations, disseminated intravascular coagulation (DIC), acute renal failure (ARF), intravascular hemolysis, pulmonary edema, shock, cardiac arrhythmia, neurotoxicity (ptosis, external ophthalmoplegia, muscle paralysis, and cerebrovascular stroke), and death. Bleeding manifestations and acute kidney injury (AKI) are common events following⁵.

Prothrombinase complex in snake venom is made of protease factor (f) Xa and cofactor (f) Va. These factors convert prothrombin to thrombin creating coagulopathy, which can bring about parenchymal haemorrhages. Discharging poison causes Venom-induced consumptive coagulopathy (VICC) and also guides endothelial harm which can prompt fatal intracerebral bleed, for example-subarachnoid haemorrhage. Proteases annihilate the walls of the veins, enact fibrinolysis, and cause serious haemorrhages⁶.

Conclusion

Cerebral complications are not too common following snake bites, however are associated with high morbidity and mortality. So even though intracerebral hemorrhage is not very common post vasculotoxic snake envenomation, it is advisable to have patients undergo a CT brain plain scan to rule out an intracerebral bleed or to detect one early and thereby reduce the neurological complications that may follow.

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