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Case Report

Anti Snake Venom Induced Anaphylactic Reaction: A Case Report

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Abstract

Adverse reactions to snake antivenom are widespread in many places of the world where snakebite is common. Mortality due to snakebites and serious adverse reactions to anti-snake venom (ASV) are both underreported in India. Antivenom is an immunoglobulin usually pepsin refined F(ab)2 fragments of IgG purified from the serum or the plasma of a horse or sheep that has been immunized with the venom of one or more species of snakes which is given to prevent snake venom from binding to tissues causing serious blood, tissue, or nervous system problems. In India only polyvalent ASV is available. Benom vial of 0.0021gm powder is a polyvalent ASV. Suspected ADRs due to anti-snake venom were reported from the emergency department. The ADRs were filled in Suspected ADR reporting form and as per WHO-UMC causality assessment scale, causality was assessment was done and ADRs were reported through vigiflow to Indian Pharmacopoeia commission, Ghaziabad. A case report of anaphylactic reaction due to anti-snake venom was presented. A 12-year old male with history of snake bite presented with neurological symptoms such as pupil mydriasis, ptosis and treated symptomatically with Antisnake venom but after half an hour anaphylaxis reaction occurred due to Antisnake venom. Symptomatic treatment was given and patient was recovered. Snake bite is a medical emergency faced mainly by rural populations. Anaphylaxis reactions are rare and are dependent on the patient's inherent characteristics which cannot be modified. As a clinician, it is our responsibility to report these reactions to ensure treatment at right time to right patient with right drugs and doses.

Keywords: Adverse reaction, anti-snake venom, Anaphylaxis.

Introduction

Snake bite is a major problem in India and it has been estimated nearly 1.2 million snakebite deaths (average 58,000/year) have been reported from 2000 to 2019. [1] Nearly half occurred between age groups of 30–69 years and over a quarter in children < 15 years. Most occurred at home in the rural areas.

The World Health Organization (WHO) estimates that 81,000–138,000 people die each year from snakebites worldwide, and about three times that number survive are left with amputations and permanent disabilities [2] Adverse reactions to snake anti venom are widespread in many places of the world where snakebite is common.

Bites by venomous snakes can cause acute medical emergencies involving shock, paralysis, hemorrhage, acute kidney injury and severe local tissue destruction that can prove fatal or lead to permanent disability if left untreated.

Most deaths and serious consequences from snakebite envenomation i.e. exposure to venom toxins from the bite can be avoidable by timely access to safe and effective antivenoms [3]

Majority of snakebites in India results from "Big 4" species namely *Daboia russelii* (Russell's viper), *Naja naja* (common Indian Cobra), *Bungarus caeruleus* (common krait) and *Echiscarinatus* (saw-scaled viper). [4]

In this case report, a 12-year-old male patient was administered with Anti snake venom (ASV) after admission to a tertiary care hospital with complaints of snake bite who later developed with hypersensitivity reaction with ASV.

Case Scenario

A 12-year-old male patient presented in hospital emergency on 04/09/2022 with history of unknown insect bite on right hand along with chief complaints of right-hand swelling, pain abdomen and vomiting (1episode) with state of drowsiness for 1 day.

History of Present Illness: Patient came in emergency with history of unknown insect bite on right hand on 03/09/2022 at 3 am with complains of pain in abdomen and 1 episode of vomiting and he was taken to nearest CHC center, managed symptomatically and referred to higher center.

On examination: Pallor – present, Vitals: HR-104bpm, Weight -30kg, RR-24/min, BP-130/80mmHg Systemic examination: CVS: S1 and S2 present CNS: conscious, disoriented Ptosis present, left pupil sluggishly reactive to light (RTL) and right-side pupil normal RTL. Deep tendon reflexes present.

Per abdomen: soft and nontender on palpation with no organomegaly. Whole blood clotting time <20 seconds.

Lab investigations showed -Hb-11.7 gm/dl, Urea-41 mg/dl, Total Ca^{2+} - 6mg/dl, Sodium- 135mEq/l, Creatinine- 0.4 mg/dl, Total Bilirubin-0.9 mg/dl. In view of neurological symptoms of snake bite, patient was managed in emergency with the following measures- Patient was kept NPO, Foley's catheter in situ Inj anti snake venom 10 vials in 100 ml NS at 1 hour I/V, Inj Atropine 2mg I/V followed by Inj Neostigmine 1mg (2ml) I/M, IVF DNS100ml with Inj KCl 5ml @65ml/hour, Inj Ceftriaxone 1gm I/V twice a day, Inj Pantoprazole 25 mg I/V twice a day.

After half an hour of ASV infusion, patient started complaining of redness on face along with rash, ASV infusion was stopped immediately, and patient was managed symptomatically with inj. Pheniramine 12mg and inj. dexamethasone 4mg I/V stat. later his symptoms subsided.

Figure 1: Redness on face along with rash

Discussion

In recent years first aid measures for snakebites have been radically revised to exclude methods such as tight tourniquets, wound incisions and ice.

Males are more often bitten than females, except where the work force is predominantly female (e.g., tea and coffee picking). The peak age for bites is children (WHO UNICEF, 2010) and young adults.

ASV is a specific antidote to snake venom actions. The exact dose of venom injected at the time of bite by the snake is not known, similarly the amount of ASV required to neutralize the circulating venom cannot be detected clinically. Hence dose of ASV administered varies from clinicians to clinicians.

Anaphylaxis is a life-threatening, systemic hypersensitivity reaction characterised by fast onset with involvement of skin and mucosal abnormalities. Food, medications and insect stings are the most common causes for such types of reactions. All antivenom treated individuals are considered reactive and susceptible to antivenom-induced hypersensitivity responses.

Robert Cannon DO *et al.,* 2007 [5] conducted an observational cohort study and data obtained from a chart review included 93 patients on antivenom dose of 12 vials with incidence of acute hypersensitivity reactions in 5 out of 93 (5.4%), patients developed mild reaction that was subsided after treatment and finished the full course of antivenom,

only 1 patient developed a reaction that prevented further antivenom administration.

Patients who remained asymptomatic after receiving human immunoglobulin, complement activation and immune complexes, treatment with anti snake venom caused hypersensitivity reactions.[6]

Ayça *et al.,*2008 [7] reported 34 out of 45 patients treated ASV in which 8 patients (17.8%), developed allergic reactions after antivenom therapy.

The adverse reactions due to anti snake venom include respiratory failure, shock, cellulitis, MODS (multiple organ dysfunction syndrome), VICC (venom induced consumptive coagulopathy). In our case the patient had redness on face along with rash which subsided after giving treatment.

In contrast to present case study, Ali Karakus *et al.,* 2015 [8] reported snakebite-related cases of 125 patients, anti snake venom were administered to each of 25 patients (20%) developed anaphylactic reaction. (n=2; 1.6%)

In another study, Fan-Jie Zeng *et al.,* 2017[9] reported a case report of a 75- year old male bitten on the thumb and index finger of right hand by a venomous snake presented with swelling and pain, after administered Fab fragment antivenom developed anaphylactic reaction.(0.8% incidence with Fab fragment antivenom)

A wide proportion of patients develop reactions, either early (within a few hours) or late (5 days or more) after being given anti-snake venom. In India, these antivenoms cause reactions in 5.6 to 56% of recipients, 10-15% of which are moderate to severe. [10]

Causality Assessment

As per WHO UMC Causality assessment scale the causality was found to be PROBABLE. As patient showed improvement in symptoms after withdrawal of anti snake venom injection. ADR was reported to Pharmacovigilance center in the Department of pharmacology.

Conclusion

Anaphylaxis is a life-threatening, systemic hypersensitivity reaction characterised by fast onset reaction on skin and mucosal abnormalities can significantly impact the quality of life for that dose modification or treatment discontinuation may be required. Patients taking medications with propensity to develop anaphylactic reactions should be informed for the potential development of this condition. Clinicians should closely monitor patients receiving ASV, be aware of prevention and management strategies that may reduce its incidence, duration and severity of anaphylactic hypersensitivity reaction.

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Authors Contribution

Bhavana Srivastava, Neeraj Rajdan, Shujjaudin, Kunal Sharma contributed in writing the manuscript where as Kaplana Joshi and Bhawna Virak provided the particulars and details of the patients.

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