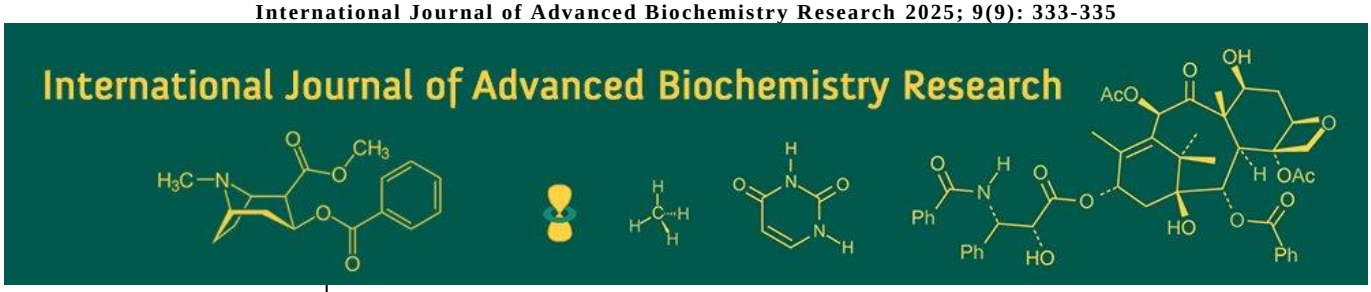

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Therapeutic management of cobra envenomation in German shepherd Rottweiler mix breed dog

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Abstract
A 3 year old male German shepherd Rottweiler mix breed dog was presented at Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Kamdhenu University, Junagadh with the history of snakebite, recumbency with unconsciousness. On the basis of snake identification, clinical signs and symptoms, case was diagnosed as cobra envenomation. Hematological analysis revealed leukocytosis and neutrophilia. Animal was treated with Polyvalent Anti-snake venom serum along with the supportive therapy. Dog was conscious on the very next day and recovered after 2 days of follow up therapy.

Keywords: German shepherd Rottweiler mix breed, snakebite, cobra envenomation

Introduction
Cobra snakebite envenomation in animals is an emergency which requires immediate attention or otherwise delayed and inadequate treatment may prove fatal (Turkar *et al*., 2017) [16]. There are nearly 216 species of snakes in India in which 60 are considered poisonous (Gupta and Peshin, 2014). Major venomous snakes in India are the Spectacled Cobra (Naja naja), Common Krait (*Bungarus caeruleus*), Russell's Viper (*Daboia russelii*) and Saw-scaled Viper (*Echis carinatus*) (Ramkumar *et al*., 2020) [10]. Territorial and aggressive dogs have the tendency to chase and attack predators like snake and get bitten in face and other extremities. (Senthilkumar *et al*., 2022) [10]. The present clinical report describes successful therapeutic management of Cobra snake envenomation in a German shepherd Rottweiler mix breed dog.

Case History
A 3 year old male German shepherd Rottweiler mix breed dog was presented at Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Kamdhenu University, Junagadh with the history of conflict with cobra snake, recumbency with unconsciousness. Vital parameters recorded were 103.5°F rectal temperature, respiration rate 28 breaths/min, heart rate 114/min, haemorrhagic conjunctival mucous membrane. On clinical examination, fang marks visible on left side part of lower lip (Fig. 1), swelling and paralysis of affected lip, salivation, drooling of tongue and dysponea were also evident (Fig. 2). On the basis of snake identification (Fig. 3), clinical signs and symptoms case was diagnosed as cobra envenomation. Blood sample was collected in EDTA vial for hematological analysis revealed leukocytosis (22000/ml) and neutrophilia (83%).

Treatment
Dog was treated with Lyophilised polyvalent snake venom antiserum (Bharat Serum and Vaccines Limited) (Fig. 4) 10 ml diluted in 500 ml Normal Saline given slow intravenously followed by supportive therapy which includes Dexona-Vet injection (Zenex Animal Health) @ 2 mg/kg i/v, Intacef Tazo Pet (Intas Pharmaceuticals Ltd) @ 25 mg/kg i/v, Atropine Sulphate (Morvel Laboratories Ltd) @ 0.04 mg/kg i/m, Avilin Vet (MSD Animal Health) 2 ml i/m and Tetanus Toxoid (Serum Institute of India pvt Ltd) 2 ml i/m. Dog was conscious and responsive to external stimuli on the very next day (Fig. 5) and fully recovered after 2 days of follow up therapy.

Discussion

Snake venom is a mixture of bioactive proteins and polypeptides, produced and stored in a highly specialized venom gland. After their administration through a bite, these proteins and polypeptides function as toxins and attack various physiological systems, often leading to death and debilitation of the prey or victim (Doley & Kini, 2009) [5]. Envenomation by cobra was manifested clinically as neurotoxicity and if not attended immediately, could lead to respiratory failure and death by preventing binding of acetylcholine to nicotinic receptors in post-synaptic membrane of skeletal muscles (Turkar *et al*., 2017) [16]. Clinical signs like visible fang marks and swelling at biting site, salivation, dullness and recumbency with unconsciousness were observed in present case finds similarities with the observation of other workers (Patel, *et al*., 2011, Pal *et al*., 2012, Anoop *et al*., 2016, Abinaya *et al*., 2019, Dhillon, *et al*., 2020, Sadhu *et al*., 2024) [9, 8, 3, 1, 4, 12]. The alterations in the hematological parameters correlated with the findings of Vijay Kumar *et al*. and Turkar *et al*. due to damage to the blood cells by snake venom (O'Shea, 2005) [7]. Polyvalent snake venom antiserum was given in this case because it provides protection against the venom of big four (common cobra, common krait, saw scaled viper and russell's viper) species of the snakes (Suchitra *et al*., 2010) [15]. According to Sai (2008) [11] sometimes lyophilized polyvalent anti-snake venom may cause anaphylactic reactions to overcome serum sickness, dexamethasone injection was given to the dog. Prophylactically, Tetanus toxoid and broad spectrum antibiotic were administered to the dogs, as the fangs of the snake are supposed to be contaminated with various types of bacteria and Atropine sulphate was given to prevent the undesirable muscarinic effects of acetylcholine such as increased secretions, bradycardia and colic (Ananda, *et al*., 2009) [2]. The use of antihistamine for the treatment of snake bite is of general practice but its use is contraindicated as it potentiate the toxic action of venom (Singh, 2002) [14].

In this present case cobra envenomation was successfully treated with polyvalent snake venom antiserum along with supportive therapy.

Fig 1: Fang marks on left side lower lip

Fig 2: Swelling and paralysis of affected lip

Fig 3: Cobra snake

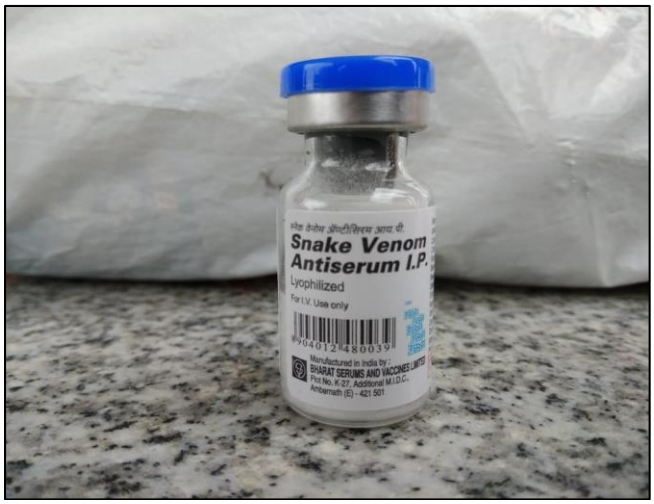

Fig 4: Snake Venom Antiserum

Fig 5: Conscious and alert response by dog (next day)

Conclusion

In conclusion, the present case highlights that cobra envenomation poses a severe threat due to its neurotoxic effects, which can rapidly lead to life-threatening complications if not managed promptly. Early recognition of clinical signs, timely administration of polyvalent snake venom antiserum, and supportive therapy, including corticosteroids, atropine sulphate, antibiotics, and tetanus prophylaxis, played a crucial role in successful recovery. The case also emphasizes the importance of careful monitoring to prevent adverse reactions to antivenom and the need to avoid contraindicated drugs such as antihistamines. Effective management ensures favorable outcomes in cobra envenomation.

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