



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; SP-10(10): 544-546  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 13-08-2021  
Accepted: 15-09-2021

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## Successful management of Russell's viper (*Daboia russelii*) snake envenomation in two German shepherd dogs

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#### Abstract

Two German shepherd dogs were referred with the history of facial swelling due to fight with the Russell's viper snake. Based on the picture of the snake presented by the owner and clinical signs the cases were diagnosed as envenomation due to snake bite. The dogs were treated with polyvalent anti-snake venom along with supportive therapy and the dogs made an uneventful recovery.

**Keywords:** German shepherd, snake envenomation, Russell's viper, polyvalent anti-snake venom

#### 1. Introduction

Snake bite is a routinely occurring life threatening emergency in tropical countries like India. So far 216 species of snakes have been identified in India, of which 52 are known to be poisonous (Bhardwaj, 2011) [3]. Five most common poisonous snakes found are Cobra, King Cobra, Russell's Viper, Saw Scaled Viper and Krait. Snake bite in animals generally occurs during grazing, hunting or while playing in the garden (Turkar *et al.* 2017) [9]. Russell's viper, (*Daboia russelii*) is a highly venomous terrestrial snake of the family *viperidae*. Snake envenomation occurs most commonly in dogs which are kept under free range (Garg, 2000) [4]. Snake envenomation is an emergency condition which requires immediate intervention otherwise it may cost the life of animal. The present report records successful management of Russell's viper snake envenomation in two German shepherd dogs.

#### 2. Materials and Methods

Two female German shepherd dogs aged 12 and 2 years respectively were presented to Veterinary Clinical Complex, Veterinary College and Research Institute Theni with the history of fight with snake, dullness, facial swelling. Detailed clinical examination of the animals revealed lethargy, staggering gait, cyanotic swelling and pain in the right temporal region and blood clot on the bite area at the base of right ear in the 12 years old dog and in the tip of the nostril in the 2 years old dog. The temperature was 100°F in the 2 years old dog and 99 °F in the 12 years old dog. The dogs were treated with slow administration of 10 ml of lyophilized polyvalent anti-snake venom (Bharat Serums and Vaccines Limited, Mumbai) along with 500ml of normal saline intravenously. Beside this broad-spectrum antibiotic, Amoxicillin and Cloxacillin@ 25mg/kg was administered intravenously. Two ml of Chlorpheniramine maleate and 0.5 ml of Tetanus toxoid were administered intramuscularly. Second day onwards the animals were administered only with antibiotics and fluids for five days.

#### 3. Results and Discussion

Naturally, dogs and Russell's Viper tend to fight each other rather than trying to escape, which is in contrast to man-snake encounters (Adhikari *et al.* 2019) [1]. Envenomation to dogs generally occurs when they play in gardens. Usually mouth, neck and legs are the common sites of snake bites (Hussain *et al.* 2011) [5].

In the present report, the physical examination of the dogs revealed dullness, staggering gait and oedema around the snake bite area which was in agreement with Yogeshpriya *et al.* 2017 [11] who reported clinical signs such as dullness, depression, staggering gait, oozing of blood from bitten area and oedematous face. This clinical sign could be attributed to the enzymatic and non-enzymatic compounds in the snake venom. Species of the snake was

identified by the owner and was also confirmed with the photo of the snake presented by the owner. Venom of Russell's Viper consists of cytotoxins, which possibly were the reason to experience varying degree of pain by the victim. Cyanotic swollen areas with fang marks at the base of the ear and tip of the nostril might be due to local necrosis since oral cavity of snake has bacterial contaminants (Mwangi *et al.*, 2014) [7], whereas according to Klaassen, 2008 [6], the oedema observed at the site of bite might be attributed to enzyme hyaluronidase which acts as a spreading factor. Gradual reduction in the size of the swelling around the fang mark was noticed on the second day of treatment.

While coagulopathy is a feature of many envenomation in small animals, spontaneous haemorrhage as a result is not. The dogs were reported by the owner to be bleeding prior to presentation. Venom-induced consumptive coagulopathy may severely alter haemostatic capability, and any minor injury prior to presentation could potentially result in such clinically apparent haemorrhages (Valenza *et al.* 2021) [10].

Polyvalent snake anti-venom was preferred in the present case as it provided 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) [8]. Management of snake envenomation is more critical in dogs as they may not survive snake envenomation if not diagnosed and treated in short time and may be life threatening. Approximately 80% of pets survive snake envenomation if treated quickly (Anoop Kumar *et al.* 2016) [2] as also observed in the present cases.



**Fig 3:** Russell's Viper (*Daboia russelii*)



**Fig 4:** Reduced facial swelling after 2<sup>nd</sup> day of treatment



**Fig 1:** Snake bite area with blood clots (arrow mark) and facial swelling in 12 year old dog



**Fig 2:** facial swelling in 2 years old dog

#### 4. Conclusion

Snake envenomation due to Russell's viper bite in two German shepherd dogs and successful management with polyvalent antsnake venom and supportive therapy is reported

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