

Credentials of Poisonous and Non-Poisonous Snake – A Mini review

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Abstract

Snakebites are a serious public health problem in many regions of the world, particularly in rural areas lacking medical facilities. The World Health Organization (WHO) estimates that 81,000–138,000 people die each year from snakebites worldwide.

Keywords: Snakebite • Venomous snakes • Venom protein

Introduction

Venomous and poisonous animals are a considerable origin of global morbidity and mortality. There are about 216 species of snakes identifiable in India, of which 52 are known poisonous. The major families of snakes in India are Elapidae which includes common cobra (*Naja naja*), king cobra and common krait (*Bungarus caeruleus*), viperidae includes Russell's viper, saw scaled viper (*Echiscarinatus*) and pit viper and hydrophidae (the sea snakes) [1].

Snake Bites

The World Health Organization (WHO) estimates that 81,000–138,000 people die each year from snakebites worldwide. Bites by venomous snakes can cause acute medical emergencies involving shock, paralysis, hemorrhage, acute kidney injury and severe local tissue destructions [2]. 52 poisonous species of snakes are available in India, majority of bites and mortality are due to *Ophiophagus hannah* – king cobra, *Naja naja* – spectacled cobra, *Daboia russelii* – Russell's viper, *Bungarus caeruleus* – common krait and *Echiscarinatus* – saw-scaled viper [3] in India every year especially in rural areas; however, the unreported cases may be even more.

Identification of Poisonous and Non-Poisonous Snake

Poisonous snakes generally possess the following character

1. Vertically elliptical shaped cat like pupil.
2. A small depression (termed pit) between the eyes and nostrils.
3. Triangle shaped head e.g. Copperheads and rattle snakes, exception-Elapids.
4. Underside scales of tail go completely all the way across in a single row from the analplate; the very tip of the tail may possess two scale rows.
5. Head and body both are seen during swimming time.
6. Generally of multiple colors.
7. Emitting a warning rattle (a dry, whirring sound)

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E.g. Rattlesnakes, not to be confused by the sound due to the vibration of several other poisonous and non-poisonous snakes [4].

Non-poisonous snakes generally possess the following characters

1. Round pupil in the centre of eye.
2. 'U' shaped head.
3. Two rows of scales from the vent to the tail end.
4. Only head is seen during swimming time.
5. Generally of one colour.
6. Mostly stripes are from head to tail [4].

Snake venom is one of the most incredible and unique adaptations of animal evolution, which has evolved to have a strong balance in their toxic and digestive components. Venoms are the secretory substances of the venomous animals, which are synthesized and stored in specific areas of their body. Several isolated snake venom proteins with a known mode of action have found practical application as pharmaceutical agents, diagnostic reagents or preparative tools in haemostaseology, neurobiology and complement research [5] (Figure 1).

Classification of Snake Venom

Snake venom can classify as four based on their clinical effect.

Neurotoxicity: This effect is caused by neurotoxins. These toxins can act either pre-synaptically or post-synaptically resulting in blocking transmission at neuromuscular junctions leading to paralysis of skeletal muscle [6].

Hemotoxicity: Hemotoxicity is chiefly caused by anticoagulants, procoagulants, fibrinolysins, haemorrhagins and haemolysins. These hemotoxins produce clinical symptoms such as haemorrhage and anemia [7].

Cytotoxicity: Edema, blisters and necrosis are frequently seen at the site of bites caused by Viperidae or Elapidae. These are due to local effects of cytotoxic components [8].

Myotoxicity: Skeletal muscle damage caused by snake venom myotoxins can be local or systemic leading to skeletal muscle breakdown, muscle weakness, pain, tenderness, and myoglobinuria [9].

Conclusion

Hence this mini review deals with understanding of snake bite and identification of Poisonous and Non-Poisonous Snake. This is the important crusade to do proper treatment for snake bite.

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