

Seasonal Study of Deaths due to Poisoning by Snake Bite in Area Limits of Hyderabad, Telangana State

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ABSTRACT

Introduction: Deaths due to snake bites are common in rural areas in India. This study on deaths due to poisoning by venom of snake bite was conducted to assess the incidents in relation to the various seasons in Hyderabad area limits of Telangana State

Material and methods: Of the total number deaths due to snake bites per month in a year, the incidents were noted for four years from 1st January 2012 to 31st December 2015 in Osmania General Hospital mortuary. Usually with the dead body, the attendants bring the snake after killing it. The site of bitten area was observed to identify the type of snake. Out of the total suspicious deaths that were autopsied in the mortuary of Osmania General Hospital for four consecutive years, data of snake bite deaths were collected month wise in a year.

Results: The data was compared for four years. It was noted that there is increase in incidents of deaths due to venomous snake bites in the months from June to September every year. The incidences of deaths due snake bites are relatively less in the winter and summer seasons. The type of snake can roughly be identified by examining the site of bite.

Conclusion: From the observations, it was concluded that with the onset of monsoon the snakes usually comes out of their burrows when it is flooded with water, which results in increase in venomous bites to humans with the onset of monsoon.

Keywords: Burrows, Monsoon, Snake bite, Venom.

INTRODUCTION

Deaths due to snake bites are common in rural areas in India. This study on deaths due to snake bite was conducted to assess the incidents of snake bite in relation to the various seasons in Hyderabad area limits. Of the total number deaths due to snake bites per month in a year, the incidents were noted for four years in Osmania General Hospital mortuary. Usually with the dead body, the attendants bring the snake after killing it. Out of the total suspicious deaths that were autopsied in the mortuary of Osmania General Hospital for four consecutive years, from 1st January 2012 to 31st December 2015, data of snake bite deaths was collected in a year. The data was compared for four years. It was noted that there is an increase in incidents of deaths due to snake bites in the months from June to September every year. Hence it was concluded that with the onset of monsoon the snakes usually comes out of their burrows when it is flooded with water, which results in venomous bites to humans The doctor conducting the autopsy should be able to differentiate between the poisonous and non-poisonous snakes when

brought by attendants for identification. By examining the site of bite we can roughly identify the type of snake. Those farmers, working in fields and bushes are at higher risk of being bitten by snakes which may or may not be poisonous. The common sites for snake bites are lower limbs but there are reports of being bitten on other body parts like hands. If immediate first aid and antidotes are not given, it can be fatal.

Snakes (also referred to as serpents) are limbless creatures with elongated bodies covered with scales.¹ Deaths due to snakebites are common in India when compared to the developed nations. Most snake bites are inflicted on the lower limbs of farmers; plantation workers, herdsman, and hunters². The snakes have to be identified when brought along with the dead body of person bitten by it. Seasonal peaks in the incidence of snake bite are associated with agricultural activities, such as ploughing, or to fluctuations in the activity or population of venomous snakes³. The snakes should be identified whether it is poisonous or non-poisonous. This can be done by examining the belly scales of the snakes. If the belly snakes are extending the whole breadth of the belly usually it is a poisonous snake. If the belly scales are narrow and does not cover the entire belly, they are non poisonous. Snake venoms may contain 20 or more components. More than 90% of the dry weight is protein in the form of enzymes, nonenzymatic polypeptide toxins and nontoxic proteins.³ Every year about two lakh individuals are bitten, of whom an estimated 15000 subsequently die.¹

MATERIAL AND METHODS

In this four years of retrospective study, the statistics related to a total of 143 autopsies done on deaths due to snake bites in the Department of Forensic Medicine, Osmania Medical college and Osmania General Hospital, Hyderabad. It was

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done to know the cause of increase in number of deaths due to snake bites during certain months of the year. The data for four years was collected to analyze the number of deaths due to snake bite in various seasons. Venomous snakes are classified into five families.

They are 1. Colubridae 2. Elapidae 3. Atractaspididae 4. Viperidae 5. Hydrophidae.

Colubridae family constitutes about 2/3rd of all snake species on earth. Elapidae family contains the snakes that cause major snake bites like Cobras, kraits, mambas and coral snakes. The atractaspididae include burrowing asps which are not a major cause of snake bites. In viperidae, they have fangs that are hollow syringe like needles. Hydrophidae includes sea snakes.

The non poisonous snakes that are dangerous to humans include Pythons and Boas. They kill by constricting around chest causing traumatic asphyxia. The venomous snakes that are commonly encountered in India are Russell’s viper; saw scaled viper, common cobra, King cobra, common krait, banded krait and sea snake.

The antigenic structure, composition and toxicity vary in different snakes. The snakes can also be classified according to the mechanism of action of their venoms. They are a. Neurotoxic b. Vasculo or Hemotoxic c. Myotoxic.

Among the snakes that produce neurotoxin are from the family of Elapidae, like Cobras, kraits, mambas and coral snakes. Those that produce venom which is vasculotoxic or hemotoxic are those from Viperidae family like Russell’s viper, pit viper and rattle snake. Those that produce toxin that affects muscles belong to the family of Hydrophidae like sea snakes. The saliva of snakes is its venom. It is composed of proteins, polypeptides and organic and inorganic substances. The local and systemic effects are produced by the enzymatic component of venom. The fatality is caused by the nonenzymatic component⁴. When a venomous snake bites, it normally leaves two faint impressions, the distance between them 8mm to 4 cm. Dry bites are those in which the venom fails to get injected, and are approximately 20% of the total snake bites.

RESULTS

The data collected month wise for four consecutive years

Year	Total autopsies	Deaths due to poisoning
2012	4813	467(9.70%)
2013	5092	399(7.83%)
2014	5233	438(8.36%)
2015	5264	395(7.50%)

Table-1: Year wise distribution of deaths due to Poisonings

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
2012	2	0	0	1	3	1	5	5	0	4	0	1	22(4.7%)
2013	2	0	1	2	2	7	3	2	2	3	2	0	26(6.5%)
2014	4	0	3	8	3	3	10	10	5	8	4	2	60(13%)
2015	0	3	1	3	3	4	6	2	6	1	6	0	35(8.8%)

Table-2: Month and year wise distribution of deaths due to snake bite

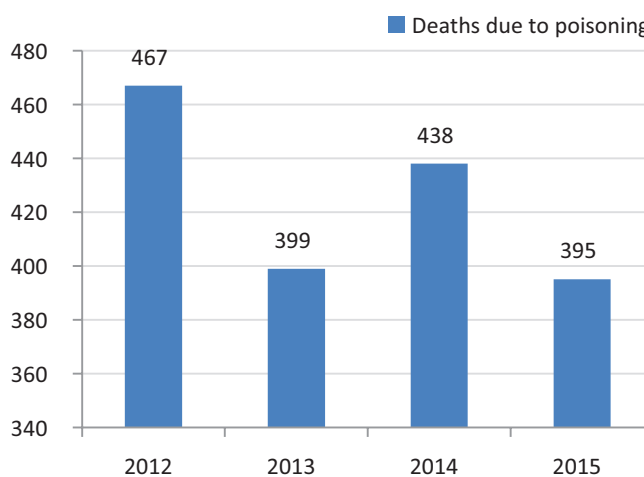
showed that there is increase in the deaths due to snake bite in the months from June to October every year which constitute the rainy season. Though there are incidents of snake bite deaths in other months but there is constant increase during the onset of monsoon.

RUSSELL’S VIPER OR DABOIA (kander, charn viper, khadchitro) has a flat, heavy and triangular head with white V-shaped mark, the angle of V pointing forwards. It has three rows of diamond shaped black or brown spots along the back, the outer two rows consisting of spots ringed with white edges. Its body is whitish with dark semilunar spots. It narrows towards its tail, which is short. It can be identified by the entire broad plates on the belly, the small scales on the head, and the shield beneath the tail divided into two rows. It is heard to hiss loudly and continuously. It is found throughout India⁵ (Photograph 1).

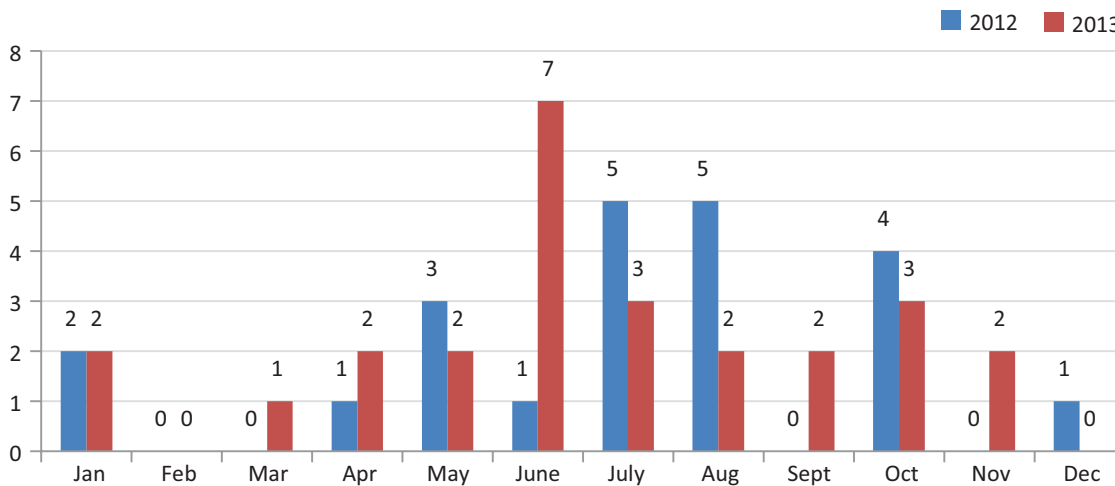
The snakes with venom that is toxic to vascular system produce typical changes related to the system (Photograph



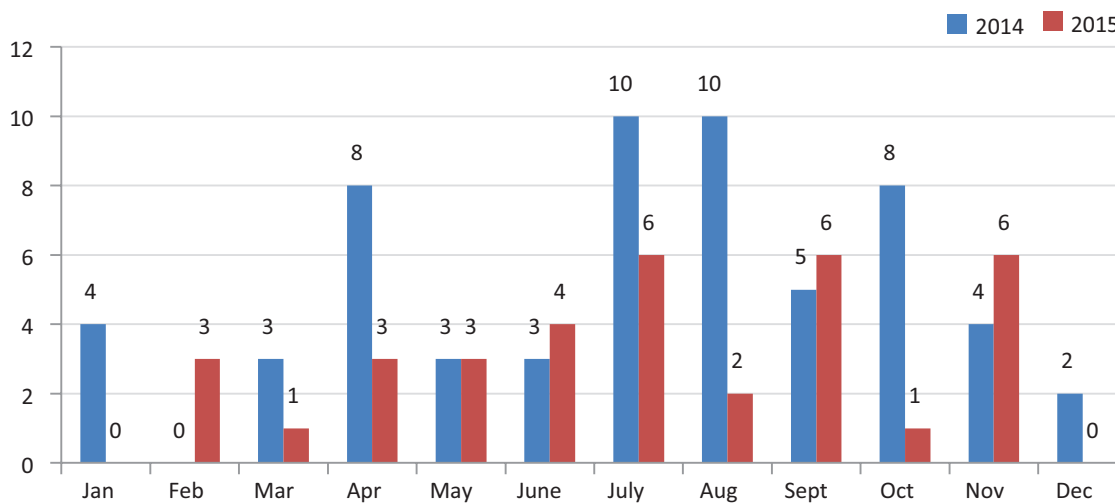
Figure-1: Sanke caught at a farm house



Graph-1: Year wise distribution of deaths due to poisoning



Graph-2: Month and year wise distribution of deaths due to snake bites 2012 and 2013



Graph-3: Month and year wise distribution of deaths due to snake bites 2014 and 2015



Figure-2: Changes in lower limb



Figure-3: Blood stained froth from nose and mouth

2). Those snake which produce venom which is affecting the nervous system leading to paralysis of respiratory muscles causing cyanosis, frothing and death (Photograph 3). Ophitoxemia is poisoning by snake venom. In more than 50% of cases, inadequate venom is injected, producing mild symptoms.⁴ Venomous snake bite is dependent on (i) species and size of snake (ii) condition of its fangs and venomous glands, (iii) pathogens present in snake venom, (iv) nature

of bite, location, number and depth. 98% of bites occur over extremities (v) length of time the snake holds on (vi) amount of venom injected. Graphs 2 and 3 shows that the number of incidents of deaths due to snake bites is similar in alternate years.

DISCUSSION

The doctor in the emergency department must know how



Figure-4: Fang impressions on left elbow

to identify the difference between the poisonous and nonpoisonous snakes. Usually the attendants bring the dead snake along with the victim of snake bite. In autopsy room also the doctor conducting the postmortem examination of death due to snake bite should be aware of the differences between the poisonous and non poisonous snake. The site of bitten area should be examined. The area of bite should be looked for fang marks which usually presents as two punctured impressions. In case of bite due to nonpoisonous snakes the bite marks presents as small U shaped impression. In case of bite due Vipers, a typical vascular reaction of the bitten site is observed (Photograph 2). In case of bites due to Elapids, there is froth around nose and mouth due to respiratory failure (Photograph 3) and fang marks on the bitten site (Photograph 4). The Polyvalent antsnake venom (PAV) is prepared by hyperimmunising horses against the venom of four common poisonous snakes, i.e., cobra, common krait, Russell's viper and saw scaled viper. Plasma obtained from hyperimmunised horses is concentrated and purified. It is useful when given within four hours of bite. Each vial of PAV will neutralise about 6 to 8 mg of venom. Test dose of PAV should not be administered as it is a poor predictor of early anaphylactoid reactions and may presensitise the patient to PAV. The circumstances of poisoning is as a rule accidental. It is very rarely used for suicide. Queen Cleopatra is reputed to have committed suicide by getting herself bitten by a venomous snake.

Occasionally, a murder is committed by throwing a poisonous snake on the bed of sleeping person⁵. In Kollam of Kerala, a twenty five year old lady was killed with cobra by her husband by releasing the snake in the bedroom where she was sleeping.

The month wise data collected for four years from the 2012 to 2015 suggests that the incidents of death due to snake bites increases with the onset of monsoon which usually starts in the month on June and extends upto October every year in Hyderabad and its surrounding areas.

CONCLUSION

Prevalence of deaths due to snake bites is higher in rural areas when compared to the urban areas. After examining

the site of bite we can identify whether the snake was poisonous or non-poisonous. The bite marks of poisonous snake consists of two circular punch like impressions when compared to non-poisonous which consists of U shaped small impressions of teeth. Not only poisonous and non-poisonous snake bites can be differentiated but also we can differentiate between vasculotoxic and neurotoxic snakes. In bites due to snakes of viperidae family the area surrounding the snake bite shows redness and vascular changes in skin surrounding the snake bite. In bites of snakes from elapidae family, there are not local changes in the area surrounding the bite but there will be blood stained froth from the nose and mouth due to respiratory failure. The increased numbers of deaths are seen with onset of monsoon and the incidences are least in winter as the snakes usually hibernate. The incidents start increasing after summer season.

From the month wise data of four years from January 2012 to December 2015 for deaths due to snake bites that were brought to the mortuary of Osmania General Hospital, Hyderabad, it can be concluded that usually there is increase in incidents of deaths due to snake bite in the months of the onset of monsoon from June to September every year (Graph 1 and Graph 2). The pattern in number of deaths is somewhat similar in 2012 and 2014 with peak incidents from June to October in each year. .

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