CLINICAL PROFILE OF SNAKEBITE IN CHILDREN
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ABSTRACT: A retrospective study of 37 cases of snakebites admitted in the pediatrics wards, MVJ Medical College from January 2012 to December 2014 was done. A detailed history, a methodological clinical profile, established treatment and follow-up in the hospital was done for all the cases and recorded. There was definite male preponderance and all the patients were from rural background. Most of the bites occurred while playing or working away from home during evening times. Most of the patients did not receive first aid after the snakebite. This shows lack of awareness of the first aid in the management of the snakebites in rural population. Most of the patients were admitted within 2 hours of the bite. Pain and swelling were the most common clinical manifestations. Other local manifestations included cellulitis and local necrosis. The neurological manifestations that were seen are ptosis and drowsiness followed by respiratory paralysis in few cases. In present study there were no cases of hypovolemic shock, intracerebral hemorrhage or DIC. All patients with signs of envenomation were given ASV according to the grading and progression of symptoms and signs. Mild early reactions were noticed in few cases, but in none of the cases there was severe reaction. Supportive treatment like IV fluids, tetanus toxoid, antibiotic coverage and anti-inflammatory drugs were given in all patients. Fasciotomy was the most common surgical intervention required. The mean duration of hospital stay in the present study was 6 days. There was no mortality in the present study.

KEYWORDS: Snake Bite, Envenomation, ASV, Cobra Bite.

INTRODUCTION: It is estimated that the true incidence of snake envenomation could exceed 5 million per year. About 100,000 of these develop severe sequelae. The global disparity in the epidemiological data reflects variations in health reporting accuracy as well as the diversity of economic and ecological conditions.1

In most developing countries, upto 80% of individuals bitten by snakes first consult traditional practitioners before visiting a medical Centre.2,3 In karnataka, about 500 people die of poisonous snakebite every year. In Sri Lanka, the overall annual mortality from a single venomous species ranges from 5.6 per 100,000 to as high as 18 per 100,000 in some areas.4 In India, Maharashtra, with the highest incidence, reported 70 bites per 100,000 population and mortality of 2.4 per 100,000 per year.5

The age and sex incidence of snake bite victims throws light on the vulnerable section of the population. While snake bite is observed in all age groups, the majority (90%) are in males aged 11-50 years. The predominance of male victims suggests a special risk of outdoor activity.6

Most patients are unable to identify the snake species either because of ignorance or poor visibility in darkness. A large number of bites occur in fields, most individuals are unable to spot the snake due to tall grass and crops. The observation that the most frequent site of bite is the
lower extremity suggests that in most cases the snake is unintentionally stepped upon. The sex ratio seems almost uniform all over with males being affected twice or thrice as commonly as females.\textsuperscript{7} Bites are maximal in lower limbs (about two thirds)\textsuperscript{8} with 40 percent occurring in feet alone.

While there are many factors influencing the outcome in victims of snake-bite, there is an overall agreement in the case fatality rate - generally varying from 2-10\%.\textsuperscript{7,9,10} The mortality rate is higher in children owing to larger amount of toxin per kg body weight absorbed.\textsuperscript{11} There is significantly higher mortality among victims who develop neurotoxicity.\textsuperscript{9,10} On an average - cobras and sea snakes result in about 10\% mortality\textsuperscript{12} ranging from 5-15 hours following bite. Vipers have a more variable mortality rate of 1-15\% and generally more delayed (up to 48 hours).\textsuperscript{13}

**OBJECTIVES:**

To analyse:

a) Clinical profile of snakebite.

b) Clinical outcome with snakebite.

**METHODOLOGY:** The cases in the present study were retrospectively collected from the department of pediatrics, MVJ Medical College and Research Hospital, Hoskote. Study period was from January 2012 to December 2014. 37 cases of confirmed snakebite were taken for the study. Source of data:

All cases were taken from the department of pediatrics, MVJ Medical College and Research Hospital.

**Method of Collection of Data:** The study was retrospective in nature, in which 37 cases of confirmed snakebite (poisonous/non-poisonous) from January 2012 to December 2014 were selected from Medical Record Department, MVJ Medical College & Research Hospital.

**INCLUSION CRITERIA:** All cases with history of snakebite in children.

**EXCLUSION CRITERIA:**

1. All cases which present with signs and symptoms of coagulopathy, hemotoxicity and myotoxicity with no history of snakebite.

2. Cases other than snakebite.

**Intervention Required:** Anti snake venom was given to patients with signs of envenomation. ASV given in the present study is manufactured by Central Research Institute, Kasauli and is polyvalent antivenin. This drug is approved for use in India. In spite of known complications of the antivenin, the benefits over score the adverse reactions. The results were analysed and discussed.

**RESULTS:** TOTAL NUMBER OF SNAKE BITES ANALYSED: 37.
SEX     NO. OF CASES  PERCENTAGE
MALE    26          71%  
FEMALE  11          29%  

**TABLE 1: INCIDENCE OF SNAKEBITE ACCORDING TO SEX**

AGE IN YEARS  NO. OF CASES  PERCENTAGE
0 – 2       02          5%  
3 – 5       03          8%  
6 – 12      19          52%  
13 – 18     13          35%  

**TABLE 2: AGE-WISE DISTRIBUTION**

TIME INTERVAL  NO. OF CASES  PERCENTAGE
6 AM – 11.59 AM 12          32%  
12 PM – 5.59 PM 06          16%  
6 PM – 11.59 PM 18          49%  
12 AM – 5.59 AM 01          03%  

**TABLE 3: APPROXIMATE TIME OF SNAKEBITE**

PLACE  NO. OF CASES  PERCENTAGE
FIELDS 12          32.43%  
OUTSIDE HOUSE 21          56.75%  
INSIDE HOUSE 04          10.82%  

**TABLE 4: PLACE OF SNAKEBITE**

TYPE  NO. OF CASES  PERCENTAGE
COBRA 03          8.18%  
VIPER 02          5.40%  
KRAIT 04          10.81%  
UNKNOWN 28          75.67%  

**TABLE 5: TYPE OF SNAKE (IF IDENTIFIED)**

Reason for More Number of Unknown Snakebite:

i) Limited knowledge about snakes by the attenders and treating doctors.
ii) In a few snakebites, the patient or the attenders weren’t able to spot the snake.

Unidentified snake bites were treated accordingly based on clinical manifestation and biochemical investigations.
The need of first-aid measure in snakebite is relatively unknown amongst the attenders. Those who have received first-aid, they had used multiple first-aid measures like Tourniquet, Immobilization, Incision and application of herbs.

| FIRST AID METHOD | NO. OF CASES |
|------------------|--------------|
| Tourniquet       | 06           |
| Incision         | 02           |
| Immobilization   | 04           |
| Application of Herbs | 02     |

**Table 6: First Aid Methods**

**Table 7: Time Interval Between Snakebite and Admission**

| TIME IN HOURS | NO. OF CASES | PERCENTAGE |
|---------------|--------------|------------|
| 0 – 2         | 27           | 72.97%     |
| 2 – 4         | 07           | 18.93%     |
| 4 – 6         | 00           | 00         |
| 6 – 8         | 01           | 2.70%      |
| 8 – 10        | 00           | 00         |
| 10 – 12       | 02           | 5.40%      |

**Table 8: Site of Bite**

| SITE                          | NO. OF CASES | PERCENTAGE |
|-------------------------------|--------------|------------|
| Distal Part of Lower Limb     | 20           | 54.05%     |
| Distal Part of Upper Limb     | 13           | 35.14%     |
| Proximal Part of Lower Limb   | 02           | 5.41%      |
| Proximal Part of Upper Limb   | 01           | 2.70%      |
| Others                        | 01           | 2.70%      |

**Table 9: Local Examination**

| LOCAL EXAMINATION          | NO. OF CASES | PERCENTAGE |
|----------------------------|--------------|------------|
| Fang Marks                 | 22           | 59.45%     |
| Swelling                   | 17           | 45.94%     |
| Cellulitis                 | 05           | 13.51%     |
| Discolouration             | 05           | 13.51%     |
| Echymosis                  | 01           | 2.70%      |
| Bleeding                   | 01           | 2.70%      |
| Petechiae                  | 01           | 2.70%      |
| Necrosis                   | 02           | 5.40%      |
| Blebs                      | 02           | 5.40%      |
| Tenderness                 | 20           | 54.05%     |
Most of the cases were probably because of non-poisonous bites and some had only local manifestations and very few had systemic manifestations. This is probably secondary to having more number of non-poisonous snake bite or “dry-bite” in our study.

Neurological cases presented with combination of altered sensorium, ptosis, difficulty in breathing and difficulty in swallowing.

Hematological cases presented with epistaxis and positive Hess test.

Out of 15 cases that required ASV administration, 4 cases [20%] developed reactions, off which most were early anaphylactic reaction. None of the cases developed bronchospasm, hypotension. They were appropriately managed with steroids, anti-histamines & IV fluids.

None of them required discontinuation of ASV.
DISCUSSION: Of the four major virulent types of poisonous snakes in India viz; cobra, krait, russel's viper and saw-scaled viper, the commonest species encountered in and around Hoskote, Bangalore Rural are the cobras.

| NO. OF CASES | PERCENTAGE |
|--------------|------------|
| 1 – 5 DAYS   | 31         | 83.78%      |
| 6 – 10 DAYS  | 05         | 13.52%      |
| 11 – 15 DAYS | 00         | 00          |
| 16 – 20 DAYS | 01         | 2.70%       |
| DEATH        | 00         | 00          |

| TABLE 14: DURATION OF HOSPITAL STAY |

Males are the victims of snakebite more often than females in all the studies including the present study. This is due to the more outdoor activity in males and the females are restricted to home. The percentage of males ranged from 68 to 74% in various studies and present study shows male preponderance with 71% which is in close relation with other studies. Male to female ratio in present study is 2.4:1.

| SEX    | PRESENT STUDY | SAINI ET AL14 | KULKARNI ET AL15 | REID ET AL13 |
|--------|---------------|---------------|-----------------|--------------|
| MALE   | 71%           | 73.3%         | 68.4%           | 72%          |
| FEMALE | 29%           | 26.6%         | 31.6%           | 28%          |

| SEX INCIDENCE |

Majority of snakebites occurred in fields and outside the home in the present study which is similar to the study done by Kulkarni et al. 11.05% of the snakebites occurred in the home.

| PLACE        | PRESENT STUDY | KULKARNI ET AL15 |
|--------------|---------------|-----------------|
| OUTSIDE HOME | 88.95%        | 75.7%           |
| HOME         | 11.05%        | 24.3%           |

| PLACE OF BITE |

Most of the snakebites were observed in lower limbs in all the above mentioned studies including the present study. Lower limb was bitten in 59% cases in the present study whereas it is 79.9% in kulkarni et al study and 82% in warrel et al study. The incidence of upper limb bites is 41% in the present study since all the cases were from rural areas and most of them sleep on the floor. But in other studies its incidence is comparatively low and ranged from 18 to 20%.
TIME OF BITE

Majority of snakebites occurred during evening time accounting for 52% in present study which could be because the snakes come out during evening time more during the summer months. This is in contrary to the study done by Kulkarni et al in which majority of bites occurred during day time accounting for 68.2%.

| TIME          | PRESENT STUDY | KULKARNI ET AL15 |
|---------------|---------------|------------------|
| DAY           | 48%           | 68.2%            |
| EVENING/NIGHT | 52%           | 31.8%            |

SIGNS

Pain and swelling were most common symptoms in present as well as other studies. Fang marks were noticed in 59.45% cases in present study but in the study done by Warrel et al, fang marks were noticed in 51% of the cases. Local necrosis was seen in 11% in the study done by Warrel et al and in the present study it is 5.4%.

| SIGNS         | PRESENT STUDY | WARREL ET AL8 |
|---------------|---------------|---------------|
| PAIN          | 80%           | 99%           |
| SWELLING      | 45.94%        | 100%          |
| FANG MARKS    | 59.45%        | 51%           |
| LOCAL NECROSIS| 5.4%          | 11%           |
| BLISTERS      | 5.4%          | 13%           |

LOCAL SYMPTOMS

In our present retrospective study, this is inconclusive owing to the fact that most of the cases presented to us were having local manifestations and less systemic signs.

| SYSTEMIC MANIFESTATIONS | PRESENT STUDY | KULKARNI ET AL15 |
|-------------------------|---------------|------------------|
| NEUROLOGICAL            | 8.1%          | 12.5%            |
| HEMATOLOGICAL           | 5.4%          | 55.9%            |

Early hypersensitivity reactions to ASV was noticed in 8.1% cases in the present study and in the study done by Kulkarni et al, the incidence was only 1.26%.

The mortality rate in our study was nil. In another study done by Lahori et al,16 the mortality was 3%. The mortality rates in other studies might be due to non-availability of medical facilities in remote rural areas, poor transport facilities to the hospital and also due to valuable time lost in giving traditional medicines.
CONCLUSION: The present study can be concluded with the following observations:
1) The morbidity and mortality due to snakebite can be substantially reduced by identifying and treating the complication as early as possible and also through health education. Limited knowledge about identifying the type of snake among both treating doctors and general population has to be addressed for a better outcome.
2) Proper awareness regarding the need, type and usefulness of first-aid measures has to be inculcated in the general rural population.
3) Early and appropriate doses of ASV in all the cases with signs of envenomation reduce mortality. Hypersensitivity to ASV is common, but rarely leads to discontinuation of its administration.
4) Ventilatory support may be needed for patients with respiratory paralysis.
5) Along with supportive treatment like inj.TT, anti-inflammatory drugs, antibiotics and surgical intervention may be required for some cases.

LIMITATIONS OF THE STUDY:
1) Retrospective study.
2) Limited number of cases.
3) Unknown snake-bites were substantial in the study.

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Date of Submission: 08/07/2015.
Date of Peer Review: 09/07/2015.
Date of Acceptance: 14/07/2015.
Date of Publishing: 17/07/2015.