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Clinical Profile of Children with Snake Bite in a Tertiary Care Center

Baljinder Kaur[1], Gurnoor Singh[2], Hitaishi Singla[3] and Kashish Singla[3*]

[1]Department of Pediatrics, GMC Patiala, India

[2]Medical Officer, GMC Patiala, India

[3]Department of Pediatrics, GMC Patiala, India

[*]**Corresponding author**: Kashish Singla, Department of Pediatrics, GMC Patiala, Punjab 147001, India

Abstract

Background: Snake bite is a major public health problem which leads to significant mortality and morbidity. Its incidence is more in rural India. The clinical profile of the snake bite depends on the various factors such as the type of snake, time of arrival in to the hospital and time of the bite (daytime or nighttime).

Methods: This is a Cross-sectional observational study conducted in a tertiary care hospital GMC Patiala Punjab from a period of January 2023 to September 2023 on children aged 1 month to 18 years presenting with the history of snake bite and fang marks or swelling at the site or in altered sensorium or with multiorgan involvement were included in the study. The subjects were enrolled in to the study after getting their written consent. The history, physical examination, demographic profile, relevant investigations and outcomes of the patient were analyzed.

Results: In our study total 50 patients were enrolled out of which 28(56%) were males while 36(72%) were females. 2(4%) in the age group of less than 1 year, 8(16%) in the age group between 1 year to 5 year, 5(10%) in the age group of between 5 years to 10 years, 25(50%) in the age group between 10 and 15 years and 10(20%) more than 15 years. 36(72%) of the children were from rural areas while 14(28%) were from urban areas. Mean duration of arrival to the hospital was 2 hours. 28(56%) cases presented with neurological dysfunction while 2(4%) presents with disseminated intravascular coagulation while 15(30%) suffered from shock. As per labs severe anemia was present in 12(24%) and deranged LFT observed in 10(20%) and 15(30%)

suffered from prerenal AKI. Mean duration of stay at hospital was 9±1 day. Overall mortality was 5(10%) however absolute mortality was observed in <1 year age group.

Conclusion: Snake bite remains a major health problem in India. In our study it was concluded that time of arrival to the hospital, type of the snake and age of the patients are the major factors which influence the final outcome of the patient

Keywords: Snakebite; Antisnake venom; Multiorgan failure

Abbreviations: AKI- Acute Kidney Injury; ARDS- Acute respiratory Distress Syndrome; ASV – Anti Snake Venom; DIC- Disseminated Intravascular Coagulation; LFT – Liver Function Tests; NIV- Non-Invasive Ventilation; RFT-Renal Function Tests

Introduction

Envenomation due to snake can cause significant morbidity and mortality. In 2014 report of American association approximately 18000 children involving less than 19 years of age were given consultation and treatment related to snake bite and 6 fatalities including one pediatrics less than 19 years of age. Not every bite from a venomous creature is harmful. In many cases no venom is injected these are called dry bite. A dry bite may occur for many reasons including failure of the venom delivery mechanism and depletion of the venom. Up to 20% of the pit viper and 50% of all the snake bites are dry. The major burden of the snake envenomation is in the Southeast Asia and Sub-Saharan Africa. Most of the snake bites are in the monsoon season. There are about 2000 species of snakes in world and around 300 species in India **[1]**. The four most important venomous snake sin India are Indian Cobra (Naja naja), Indian krait (Bungarus caeruleus), Russel Viper (Daboia russeli) and saw scaled viper (Echis carinatus). In India especially in the rural areas. significant time is lost before the arrival to the hospital because of various traditional practices which are being followed **[2].**

Figure 1: Indian Cobra.

Figure 2: Indian Krait.

Methodology

Cross-sectional observational study was conducted in tertiary care center in GMC Patiala Punjab from period of January 2023 to September 20234 children aged 1month to 18 years presenting with history of snake bite and fang marks or swelling at the site or in altered sensorium, Multiorgan involvement were included in the study. Informed written consent /assent were obtained from the parents/legal guardians respectively. All children were admitted through emergency into the pediatrics intensive care unit and were given antisnake venom antibodies as per weight and requirement of the child. All children were observed for signs of shock, DIC, encephalopathy, oculofacial paralysis, generalized paralysis, seizures and acute respiratory failure, were put on appropriate ventilation strategies, I/V fluid with symptomatic management and blood components therapy. The children were tested for complete blood counts, liver function tests, renal function tests, complete urine examination, chest radiography whole blood clotting time, prothrombin time and cranial imaging if required, and investigations were repeated as per requirement. Details of clinical profile, laboratory investigations, management and outcomes were recorded for all the participants. Abnormal viral parameters (tachycardia, tachypnea, bradycardia, bradypnea and shock) were defined as per advanced life support guidelines of Indian academy of pediatrics anemia was defined as per the hemoglobin cutoffs recommended by the WHO. A child with modified Glasgow coma scale ≤14 was considered to have encephalopathy **[3]**. Pediatrics acute respiratory distress syndrome, ALF and AKI standard definition were used **[4-6]**. All the detailed data recorded was analyzed for the purpose of study.

Total admissions in September 2023-january 2024

N=18000

Children who are admitted with snake bite N=50

Analyzed N=50

Direct admissions.		Referral	
N=40		N=10	
Survival.	Deaths.	Survival.	Death
N=39	N=1.	N=6.	N=4

Results

Out of the 18000 admissions in the department of pediatrics from September 2023 to January 2024 50 patients were admitted with snake bite. The study population ranged from age more than 1 month to 18 years where in n=3 (40%), n=8(16%), n=5(10%), n=25(50%), n=10(20%) were in the age group of less than 1 year, between 1 year to 5 years, more than 5 years to 10 years,10 years to 15 years and more than 15 years respectively. 28(56%) were male children whereas 22(44%) were female children. 36(72%) belonged to the rural area whereas 14(28%) belonged to the urban area. 5(10%) of the attendants brought decapitated reptiles along with to emergency. Only 10(20%) received first aid at home or peripheral center. Mean duration of arrival at emergency after snakebite was 2 hours. 28(56%) cases presented with neurological dysfunction while 2-4% presents with disseminated intravascular coagulation while 15(30%) suffered from shock. As per labs severe anemia was present in 12(24%) and deranged LFT observed in 10(20%) and 15(30%) suffered from prerenal AKI. Mean duration of stay at hospital was 9±1 day. Overall mortality was 5(10%) however absolute mortality was observed in <1 year age group. Out of the 50 patients 30 children were given 30 vials of ASV, and 10 children were given 20 vials and 10 patients were given 10 vials.

Table 1: Clinical and Lab parameters and complications Clinical Parameters.

Oculofacial paralysis	18(36%)
Generalized paralysis and encephalopathy	10(20%)
DIC	2(4%)
Seizures	1(2%)
Shock	15(30%)
ARDS	5(10%)

Table 2: Lab Parameters.

Deranged LFT	10(20%)
Deranged RFT	15(30%)
Severe anemia	12(24%)
Invasive ventilation	30(60%)
NIV	10(20%)
Sympathomimetic	15(30%)
Blood components	5(10%)

Discussion

Over the 1 year period 50 children of snake bite were admitted in our hospital, in our study 28(56%) were male children while 22(44%) were female children similar observations were found in the study done in Maharashtra where 34% female patients and 66% male patients were found, similarly study done by Bhat et al a ratio of 4:1 (M:F) is found. The higher incidence is found in the boys because of more involvement in outdoor activities field work **[7].** 36(72%) patients belong to the rural areas while 14(28%) belong to the urban areas, similar to the study by G Bhalla et al where rural prevalence was found to be 117 out of 150 **[8].** Mean duration of arrival in our hospital is 2 hours, this is in contrast to the study done by Yashwant et al in Maharashtra where 60.4%

patients were admitted within 0-12 hours and 9.3% were admitted after 24 hours this delay in the arrival to the tertiary center is attributed to a number of factors such as ignorance, unawareness and late referral from the tertiary care center. In the present study 5 (10%) patients had brought the decapitated reptile to the hospital while the study by G Bhalla et al patients brought the snake to the hospital **[8].** The most common local complication is swelling and pain which is similar to the studies done by Rao KV et al. **[9].** The presentation at arrival is with neurological dysfunction in 28 (56%) of patients, 2(4%) patients with disseminated intravascular coagulation, while 15(30%) with shock. In the present study the overall mortality was 5(10%) out of which 1(2%) died due to respiratory failure while 4(8%) died due to bleeding (DIC) with shock. While in the study by Surve et al, there was mortality of 3 in all 3 of them presented to the hospital late two cases had neurotoxic envenomation and died due to respiratory failure whereas one case had vasculotoxic snakebite died secondary to DIC with shock and acute kidney injury. We observed upsurge of snake bite cases following rainy season and floods in certain parts of the state with people living near fields or katcha houses, confounding factors observed were where children were left unsupervised in field areas and snake bites occurred at night time. Neurological dysfunction was observed in most of the children **[1-9].**

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