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ORIGINAL ARTICLE

Frequency, Presentation, Management and Outcome of Snake Bite in Children at DGKMC & Hospital, D.G Khan.

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ABSTRACT… Objective: To evaluate the frequency, common presentation, anti-snake venom (ASV) related management and outcome of snake bite cases in admitted children at a tertiary care hospital. **Study Design:** Case-series study. **Setting:** Department of Pediatric, Dera Ghazi Khan Medical College (DGKMC) & Hospital. **Period:** 1st March 2021 to 31st August 2021. **Material & Methods:** During the study period, all children presenting with snake bite were included. All cases were observed for their presentation, classified according to signs and symptoms, and managed through ASV as needed. **Results:** During the study period, a total of 52 patients of snake bite admitted in paediatric medical ward of DGKMC & Hospital. There were 37 (71.2%) male and 15 (28.8%) female. Overall, mean age of the children was 6.1±3.1 years. Maximum number of snake bite cases were reported during May, June and July as 15 (28.8%), 13 (25.0%) and 8 (15.4%) respectively. In the presentation, 29 (55.8%) patients presented with local symptoms only while remaining 23 (44.2%) presented with local as well as systemic symptoms. In the management, 3 (5.8%) cases did not require any ASV vial, 35 (67.3%) needed initial doses only. Fourteen (26.9%) cases required initial as well as maintenance doses. In terms of outcome, 49 (94.2%) children were discharged successfully, 1 (1.9%) expired and 2 (3.8%) got left against medical advice (LAMA). **Conclusion:** Snake bite was a common pediatric medical emergency at our institute. Most children presented with hemotoxic symptoms and needed ASV for resolution of symptoms. Prognosis is good with timely and judicious management of snake bite.

Key words: Anti-snake Venom, Neurotoxic, Snake Bite, Vasculotoxic.

INTRODUCTION

Snake bite is a neglected public health issue in many tropical and sub-tropical countries responsible for up to 138000 deaths worldwide every year.[1] In Pakistan most of the snake bite cases are reported from Punjab and Indus Delta where about 95% of country's agricultural activities take place.[2] Snake bite though a rare known entity in urban medical facilities but commonly deal in medical emergency at paediatric medical wards especially in rainy season of Monsoon. As snake bite is considered a common issue in rural settings but documented statistics about the incidence, morbidity and mortality is scarce.[3] Being least managed in most urban facilities and geographical variations in prevalence of different species worldwide, standard recommendations regarding management of snake bite currently existing are vague. International protocols regarding anti-snake venom (ASV) administration vary worldwide.[4]

Besides the use of text books and medical education, these do not adequately prepare medical personnel to treat snake bite according to local protocols and special trainings are required to adequately treat snake bite cases for satisfactory outcomes.[4] Being neighbors in sub-continent, India and Pakistan share most of their natural habitat including commonly existing snake species. There is no clear cut morphological distinction between venomous and non-venomous snakes in Pakistan.[2] Polyvalent Antivenom is known to be the most effecient treatment for envenomation in rural health centers.[5] The most widely available ASV in

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Pakistan include the liquid ASV, locally produced by "National Institute of Health Islamabad" and lyophilized liquid ASV imported from India.[6] Currently in Paediatric ward, ASV being administered is imported from India covering most of the toxic strains of existing snake species in Pakistan including Russell's viper, Himalayan Pit Viper and Common Indian Krait. We aimed to evaluate the frequency, common presentation, ASV related management and outcome of snake bite cases in admitted children at a tertiary care hospital.

MATERIAL & METHODS

This case-series study was conducted in paediatric medical ward of Dera Ghazi Khan Medical College (DGKMC) & Hospital from 1st March 2021 to 31st August 2021. All patients presented with snake bite during study period whether admitted through outpatient department (OPD) or medical emergency were included. Approval from "Institute's Ethical Committee" was taken (letter number:8859/DGKMC). Informed/ written consents were sought from parents/ caregivers.

The study population was prospectively observed clinically for complications (local/ local + systemic). Patients with systemic signs and symptoms were also evaluated through lab workup including CBC, PT/APTT and RFTs. Use of ASV for management of these complications was individualized as per need of patient and noted. In the end each patient was followed for his/her final outcome i.e. discharged/LAMA/expired. Local symptoms included any of the following: Fang marks, local pain with progressive swelling of up to 6 inches, blood oozing from bite site, erythema in first 12 hours. Systemic symptoms included: i) Vasculotoxicity presenting clinically as epistaxis, Hematuria, gum bleed, intracranial bleed &/ or deranged PT and APTT, deranged renal function test, thrombocytopenia and anemia as evidenced by lab studies; ii) Neurotoxicity clinically presenting as any of following symptoms either individually or concomitantly Ptosis, dysarthria, dysphagia, Respiratory paralysis.

Patients were managed with ASV as per their clinical symptoms and lab parameters in accordance with guidelines provided by Nelson Text book of Pediatrics. Patient was given initial dose of ASV dilated in 250 ml N/S. it was infused at 25 to 50 ml/hr. for initial 10 minutes and rate was increased to 250 ml/hr. in case of no allergic reaction. This initial rate was modified to decrease for very small/sensitive child. Patient was reassessed for the need of further initial &/ or maintenance doses after 4 hours. Maintenance dose /doses were given as 2 vials 6 hourly for maximum of 3 dozes. Final outcome was noted for each patient in the form of discharged, expired or leaving against medical advice (LAMA). All the above information was noted in a predesigned Performa. Data analysis was done adopting "Statistical Package for Social Sciences (SPSS)" version 26.0.

RESULTS

During the study period, a total of 52 patients of snake bite admitted in paediatric medical ward of DGKMC & Hospital. There were 37 (71.2%) male and 15 (28.8%) female. Overall, mean age of the children was 6.1±3.1 years, ranging between 10 months to 14 years. Figure-1 is showing distribution of cases during the study period and it was found that maximum number of snake bite cases were reported during May, June and July as 15 (28.8%), 13 (25.0%) and 8 (15.4%) respectively.

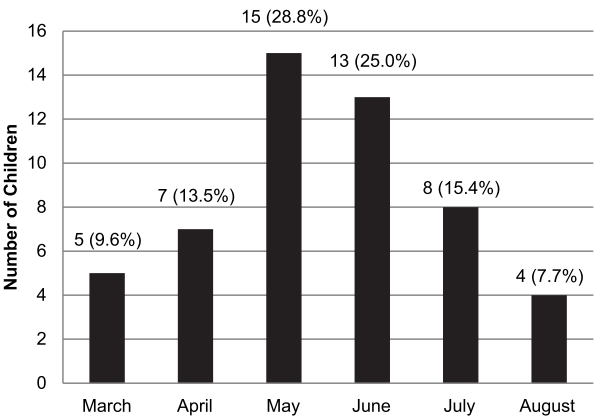

Figure-1. Presentation of children with snake bite during the study period (n=52)

In the presentation, 29 (55.8%) patients presented with local symptoms only while remaining 23 (44.2%) presented with local as well as systemic

symptoms. These all systemic symptoms were related to vasculotoxicity. None of the patient reported with neurotoxic sign and symptoms. In the management, 3 (5.8%) cases did not require any ASV vial, 35 (67.3%) needed initial doses only. Out of these 52, 4 (7.7%) cases further required repetition of initial dose. Fourteen (26.9%) cases required initial as well as maintenance doses. In terms of outcome, 49 (94.2%) children were discharged successfully, 1 (1.9%) expired and 2 (3.8%) got LAMA (Figure-2). The 1 patient expired had intracranial bleed when brought to the emergency department.

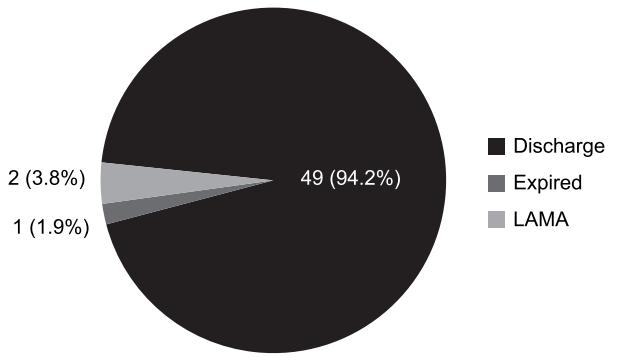

Figure-2. Outcome of children with snake bite (n=52)

DISCUSSION

Snake bite can be very dangerous and lethal in pediatric population. Snake venom poisoning is a complex medical emergency that not only involves the site of bite but may also involve multiple organ systems.[7] Envenomation may cause acute medical emergencies involving severe respiratory paralysis, bleeding diathesis, irreversible kidney failure and severe local tissue destruction, which can cause permanent disability. Parents or care givers should rush immediately to nearest available medical facility without delay.

Previously recommended first aid measures like tourniquets, incision and suction are strongly discouraged.[8] Despite the fact that use of tourniquets or cuts is useless, majority of people in rural areas use these measures as first aid.[9] A paediatrician faces multiple challenges while dealing with a case of snake bite. He/she not only has to assess the severity of envenomation along with anticipating immediate management and complications, but also has to reassure parents/guardians. Dealing with child's fear, anxiety and psychological stress endures a separate challenge. The key to minimizing mortality and morbidity is aggressive management of ABC's of resuscitation, along with timely and judicious administration of ASV.[10-12] Although most of the snake bites are reported to be non-poisonous, however possibility of poisonous envenomation has to be always excluded. Delay in hospitalization is linked with poor prognosis and increased chances of mortality because of consumptive coagulopathy, renal failure and respiratory failure.[13] We found that maximum children presented with vasculotoxic/haemotoxic effects and none of the children presented with neurotoxic symptoms. Vasculotoxicity has been found the most common presentation in multiple studies done on snake bite in rural population.[9,12] However our study population was strictly confined to pediatric age group.

In another study done in Pakistan, 65 patients were reported in 12 months period with maximum number of patients reported in the month of August.[9] In our study, 52 patients reported in 6 months period out of which maximum presented in the month of May. This difference indicates more common prevalence of poisonous snakes in surroundings of Dera Ghazi Khan. In May, summer season starts and children start dwelling in fields along with their parents for maximum period of time along with sleeping outside at nights as a local cultural trend in summers. This might be the reason for maximum cases to be reported in May. Similar results were found in study conducted by Asif et al[14] where maximum patients reported between April to September. However their studied population comprised of adults working in fields while our studied group included children only.

We were a bit surprised by complete absence of neurotoxic symptoms presentation in results, as to our knowledge existence of neurotoxic strain is not that rare in Dera Ghazi Khan and peripheries. However the rapidity of progression of neurotoxic symptoms in children might be a strong reason as patients may have expired before reaching

the only tertiary care facility available. DHQ Dera Ghazi Khan is the only tertiary care hospital covering wide area of peripheries at various distances. As these peripheries are located at long distances, approach here is not easy, owing to lack of public transport, extreme poverty and illiteracy. However, further studies are needed to elaborate others involved and suspected factors.

In the present study, overall outcome was very good as 94.2% children were successfully discharged. Delay in hospitalization is associated with poor prognosis and increased mortality rate due to consumptive coagulopathy, renal failure and respiratory failure.[13] Inadequate first aid, delayed treatment access and suboptimal treatment contribute to poor outcome in terms of mortality and morbidity.[15,16] The only expired case in our study arrived late at emergency and suffered intracranial bleed, which progressively worsened and caused death.

CONCLUSION

Snake bite was a common pediatric medical emergency at our institute. Most children presented with hemotoxic symptoms and needed ASV for resolution of symptoms. Prognosis is good with timely and judicious management of snake bite. Awareness program regarding timely access and treatment of snake bit can be planned to further improve the outcomes associated with snake bite cases.

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2	Irum Jabeen	Study idea, Design.	
3	Irfan Karim	Data Analysis, Discussion.	
4	Zohaib Hassan	Data Collection, Literature Review.	
5	Shakeel Ahmad	Drafting, Supervision.	
6	Nusrat Buzdar	Data Interpretation, Discussion.