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ORIGINAL ARTICLE

# The Investigation of the Clinical Symptoms of Snakebites in Children Admitted to Abuzar Hospital in South of Iran from 2018-2020

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## Abstract

***Introduction:*** Due to the diversity of snakes in Iran, understanding the demographic characteristics of patients can be effective in better treatment. The aim of this study was to determine the clinical symptoms of snakebites in children admitted to Abuzar Hospital of south of Iran from 2018-2020.
***Methods:*** The present study was descriptive-analytical and retrospective. A number of 145 snakebites children referred to Abuzar Hospital of south of Iran from 2018-2020 were selected by census and examined. The clarified was extracted from the analysis using SPSS software version 22.
***Results:*** The mean age of snakebite children was 10.73±3.41 years, 92 (63.4%) were male children. The mean of anti -venom intake in bitten children was 4.93±1.44, the mean BUN (Blood Urea Nitrogen) 13.70±4.01, and the mean creatinine 0.68±0.14. The mean duration of hospitalization 4.05±2.13 days and the mean duration of onset of symptoms after the bite in patients was 94.34±109.31 hours. The mean of coagulation problems in the first stage in patients was 2.76±1.91 and 82 (56.6%) of snake bred children received FFP blood product. The first symptom after a bite in 60 snakebite children (41.4%) was pain. Four patients (2.8%) were hospitalized for two days and two patients (1.4%) were admitted to the intensive care unit (ICU) for three days. The location of 49 of the snakebite children was Ahvaz (33.8%) and none of the snakebite children died.
***Conclusion:*** According to the results of this study and understanding the epidemiology of snakebite in the Khozestan province, it is possible to play an effective role in preventing snakebites and other causes by educating all health care workers and physicians as well as raising public awareness in the community.

**Keywords:** Clinical Symptoms, Snakebite, Child.

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## INTRODUCTION

Snakebite is one of the health problems in many countries of the world, which causes harassment and deprivation of comfort and death of people [1,2]. Snakebite is considered a medical emergency in many parts of the world. There are different statistics of snakebite cases in the world. According to the statistics of the World Health Organization (WHO), 300,000 cases of snakebite occur in the world every year, of which 40,000 cases lead to death [3]. So far, 75 different types of snakes have been identified in Iran, among which 21 types are poisonous [4]. The symptoms of snakebite are pain and swelling at the bite site, pain in the lymph nodes of the bitten limb, vomiting, headache, confusion, large and painful lymph nodes, blisters, necrosis, increased heart rate, rhabdomyolysis, bleeding, peripheral nerve lesions, and central and respiratory failure noted [5]. Snakebites occur mostly in the warm seasons of the year (spring to autumn and especially summer). Most of the victims are young and middle-aged men. About one third of snakebites occur in children under 10 years old. Therefore, snakebite causes complications and lost years of life to humans [6]. Snakebites are more common in school-aged children, teenagers, and young adults that account for 3% of all deaths among children between 5 up 14 years old. It is argued that 97% of snakebite victims are in rural areas with a survival rate of 3% [7]. Among the 97% of deaths, about 77% occur outside medical centers, probably because they prefer traditional treatment methods [8].

Children are more at risk of death or serious injuries due to snakebites because their bodies are small and the venom quickly enters the bloodstream transferring throughout the child's body. If a person receives special care immediately after a snakebite, the possibility of serious injuries will be minimized [9]. Symptoms of snakebite in children include the following: bleeding from the bite site, blurred vision, skin irritation, convulsions, diarrhea, dizziness, excessive sweating, fainting, fever, thirst, loss of muscle coordination,

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nausea and vomiting, numbness and tingling, tissue death, severe pain, skin discoloration, swelling at the bite site, and weakness [10]. Considering the long heat period in Khuzestan province and the seriousness of this type of bite in children, this study was conducted as an investigation of the clinical symptoms of snakebite in children admitted to Abuzar Hospital in sourth of Iran from 2018-2020.

## METHODS

The current research was descriptive-analytical and retrospective. The studied population included all children with snakebite, who had visited Abuzar Hospital in Ahvaz. For each child bitten by a snake, a checklist sheet was completed, which included demographic information as well as variables required for the research. The number of the examined sample was equal to 145 people, who were selected by census, so that all snake-bitten children referred to Abuzar Hospital in sourth of Iran from 2018-2020 were examined. The inclusion criteria for the study of children with snakebite referred to Abuzar Hospital in sourth of Iran from 2018-2020, who had a medical record. Exclusion criteria of children bitten by snakes, who did not have a complete medical record.

**Statistical Analysis:**

In order to describe the data, the mean and standard deviation were used in quantitative variables and the frequency of distribution and percentage were used in qualitative variables. After checking the normality of the data by the Kolmogorov-Smironov test, in order to analyze the hypotheses of the research, tests related to inferential statistics such as t-test and k2 were used. In all calculations, $p<0.05$ was considered as a significant level and all statistical analyzes were performed using SPSS version 22 software.

## RESULTS

Based on the obtained results, the average age of children bitten by snakes was 10.73±3.41 years. Number of 92 (63.4%) of the children were boys and 53 (36.6%) were girls. The average amount of antivenom in children bitten by snakes was 4.93 ± 1.44. The average duration of hospitalization in snake bitten children was 4.05 ± 2.13 days. The average duration of the onset of symptoms after the bite in patients was equal to 94.34 ± 109.31 hours. The average number of platelets in the blood in patients was equal to 277.89 ±66.57. The average of coagulation problems in the first stage in patients is 2.76±1.91, in the second stage it is 1.68±0.92, in the third stage, it is 1.31±0.41, in the fourth stage it is 1.07 ± 0.08 and in the fifth stage, it was equal to 1.03 ± 0.05. The mean BUN in snake bitten children was 13.70±4.01 and creatinine was 0.68±0.14. The place of residence of 49 people (33.8%) of children bitten by snakes was Ahvaz city. The bite site in 39 (26.9%) snake bitten children was the left leg. The least bitten places included abdomen, right elbow, left wrist, right forearm, second toe of left foot and right big toe. The first symptom after the bite in children bitten by snakes was pain in 60 (41.4%), which was the most common symptom, but burning was observed in only one person (0.7%). Number of 139 people (59.9%) of the children bitten by snakes did not need hospitalization in the ICU. Number of 4 people (2.8%) were admitted to the ICU for two days and two people (1.4%) for three days. None of the snake-bitten children had died. Number of 82 people (56.6%) of snake bitten children received FFP blood product and 60 people (41.4%) did not. 134 people (92.4%) of snake bitten children did not receive PC blood product, 3 people (2.1%) received half a unit, 3 people (2.1%) one unit and 5 people (3.4%) two units had received. Number of 36 people (24.8%) of the children bitten by snakes had no urinary problem, 39 people (26.9%) had urinary problem +, 21 people (14.5%) had urinary problem ++, 18 people (12.4%) had urinary problem. +++ and 31 people (21.4%) had trace urinary problem. Finally, none of the investigated variables showed a significant relationship based on the age and gender of the children.

## DISCUSSION

The results of this study showed that the average age of children bitten by snakes was 10.73±3.41 years, 92 (63.4%) boys, and 53 (36.6%) girls included the sample. Due to the fact that no extensive study was conducted on children in Iran, it could not be compared with the present study. Hanumana et al. in India showed that about 43% of children were in the age group of 7 to 12 years. In addition, boys were twice as much as girls, which is consistent with the results of the present study [11]. Mashran et al. also showed in India that out of 46 patients, 37 patients (80.43%) were older than 5 years and the ratio of boys to girls was 4 to 1, which in terms of age was somewhat consistent with the present study. However, concerning gender, this study is not consistent with the two studies. The results can be caused by differences in geographical location and habitat, as well as the type of local snakes [12].

The average amount of antivenom in children bitten by snakes was 4.93 ± 1.44. Rahimi in a study conducted on adults showed that the average antivenom used for each patient was 1.9 ± 3.3 (range 1-8 vials), and the difference in the average vial received could be due to the age difference [13]. Hafizi et al. in a study in Karun showed that 96.5% of patients received 5-10 vials of antivenom [14]. Farzaneh also showed in a study in Ardabil province that the antidote used in patients was 5.1 ± 1.3 vials, which was consistent with the results of the present study [15].

In this study, bite site in 45 (31%) snake bitten children was the left leg. The least bitten areas included abdomen, right elbow, left wrist, right forearm, second toe of left foot, and right big toe. According to the results of the study of Mashran et al. (2018) [12] in Indian children, the lower limb was the most bitten limb. Hanumana et al. (2018) [11] also showed in Indian children that about three-quarters of patients were bitten in the lower limbs, which was consistent with the results of the present study. In the study of Kojidi et al. (2017) [16], most of the bites were on the lower limb (53 cases) and Krishsagar et al. (2013) [17] observed bite symptoms mainly in the lower limb in 120 patients (74.04%). This was consistent with the results of the present study. Table 1 shows the frequency of bite sites in children bitten by snakes.

**Table 1. frequency of bite sites in children bitten by snakes**

| bite site | distribution | Percentage |
|---|---|---|
| left leg | 45 | 31 |
| right leg | 24 | 16.6 |
| left ankle | 30 | 20.6 |
| right ankle | 14 | 9.6 |
| right hand | 8 | 5.5 |
| left hand | 8 | 5.5 |
| other | 16 | 11 |
| total | 145 | 100 |

The first symptom after the bite in children bitten by snakes was pain in 60 people (41.4%), but burning was observed in only one person (0.7%). Based on the results of the study by Mashran et al. (2018) [12] in Indian children, the most common symptoms are local edema and vomiting. The present study is also consistent with Farzaneh (2015) [15], who ran a study in Ardabil province and found that patients showed symptoms of pain, swelling, erythema, and stinging ecchymosi. Nausea and vomiting were two other common symptoms. Hafezi et al. (2017) [14] in a study in Karun stated that the most common complaints of patients after hospitalization were pain (74.6%) and edema (43.9%). As seen in most studies in adults and children, pain and swelling were among the most common symptoms. Table 2 shows the frequency of the first symptom after the bite in children bitten by snakes.

None of the snake-bitten children had died. Based on the results of the study of Mashran et al. (2018) (12) in Indian children, 9 children (19.56%) and Hanumana et al. (2018)[11] also 4 children (1.7%) died. In the study of Karunanayake et al. (2014) [18] in Sri Lanka, mortality occurred in (11%) of venomous bites. In the study by Hafezi et al. (2017) [14], there were three deaths in Karun. In the study of Krishsagar et al. (2013) [17], mortality in patients, who were referred to the hospital late was reported to be 1.85%, which was not consistent with the results of the present study. The inconsistency of the results can be caused by the time of the patient's visit to the treatment center, as well as the initial measures taken for the patient. On the other hand, snake venom is also one of the influential factors [19]. No mortality was observed in Kojidi's study (2017) [16], which was consistent with the results of the present study.

**Table 2. The frequency of the first symptom after the bite in children bitten by snakes**

| The first symptom after the bite | distribution | Percentage |
|---|---|---|
| the pain | 60 | 41.4 |
| swelling | 49 | 33.8 |
| Burning and itching | 3 | 2.1 |
| Swelling and bleeding | 3 | 2.1 |
| Swelling and burning | 3 | 2.1 |
| Swelling and redness | 3 | 2.1 |
| Swelling and pain | 3 | 2.1 |
| Swelling and erythema | 3 | 2.1 |
| Erythema and redness | 3 | 2.1 |
| a bruise | 3 | 2.1 |
| Pain and vomiting | 3 | 2.1 |
| itching | 2 | 1.4 |
| Burning | 1 | 0.7 |

## CONCLUSION

According to the results of this study and the epidemiology of snakebite in the province, it is possible to play a fruitful role in preventing snakebite and death by educating all healthcare workers and doctors as well as promoting public awareness in the society. Moreover, none of the investigated variables based on the age and gender of the children showed a significant relationship, so the age and gender of the children did not show a significant relationship with urinary problems, blood products, the need for hospitalization or surgery, etc.

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**Conflict of interest:** None to be declared.

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