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A retrospective review of snake bite victims admitted in a tertiary level teaching institute

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Abstract

Objective: Snake bite remains major public health problem worldwide. We present our experience with cases of snake bites managed in our tertiary care teaching center of South India.

Materials and Methods: The details of all patients with snake bite admitted to a tertiary teaching care hospital from 2010 to 2012 were retrospectively retrieved and reviewed. The details regarding age, gender, first aid received or not, time elapsed between the bite, emergency care management and ASV (Anti Snake Venom) administration, site of snake bite, clinical features at the time of presentation, local examination findings at the site of bite, duration of hospital stay, need for elective ventilation, details of investigations and outcome were reviewed. The data were analyzed in PSPP software (Free Software Foundation, Inc.) for window for statistical analysis, while standard deviation (SD) was applied for the continuous variables, and proportions were applied for the categorical variables.

Results: Mean age was 38.4 ± 14.8 years (range 4-70 years). Majority [72 (82.8%)] were farmers. In 86.2% patients, the site of bite was in lower limbs. Snake could be identified in only 20 cases [Cobra-12 (60%), Krait-2 (10%), and Viper-6 (30%)]. Mean time to reach to hospital was 12.1 ± 21.4 hours (range 1-120 hours). Mean anti-venom therapy duration was 3.2 ± 2.0 days (range 1-14 days). Mean hospital stay was 4.7 ± 3.1 days (range 1-15 days). Majority (72.4%) made good recovery; mortality was in 4.6% cases, and 20 (23%) patients left against medical advice.

Conclusions: This study identified major epidemiological and management variables related to snake bite. There is a need for a well-planned data collection and information dissemination system to avoid this potentially preventable disease.

Key words: Anti-snake venom, anti-venoms, envenomation, snake-bite

Résumé

Objectif : Morsure de serpent de reste le problème majeur de santé publique dans le monde entier. Nous présentons notre expérience avec des cas de morsures de serpent gérés dans nos soins tertiaires enseignement Centre du sud de l'Inde.

Matériel et méthodes : Les détails de tous les patients avec une morsure de serpent admis à l'hôpital de soins de 2010 à 2012 ont été rétrospectivement récupérée et examiné l'enseignement tertiaire. Les détails concernant l'âge, de sexe, de premiers soins reçus ou non, de temps s'est écoulé entre la morsure et l'administration de soins d'urgence administration ASV (Anti venin de serpent), site de morsure de serpent, des signes cliniques lors de la présentation, les résultats de l'examen local à l'emplacement de morsure, durée du séjour hospitalier, nécessité de ventilation élective, détails des enquêtes et des résultats ont été examinés. A analysé les données dans le logiciel PSPP (Free Software Foundation, Inc.) pour la fenêtré d'analyse statistique, tandis que l'écart-type (SD) a été appliquée pour les variables continues, et les proportions ont été appliquées pour les variables catégorielles.

Résultats : Moyenne d'âge était de $38,4 \pm 14,8$ ans (fourchette de 4 à 70 ans). Majorité [72 (82,8 %)] étaient des fermiers. Dans 86,2 % des patients, le site de la morsure était dans les membres inférieurs. Serpent puisse être identifiés dans

seulement 20 cas [Cobra-12 (60 %), Krait-2 (10 %) et Viper-6 (30 %)]. Délai moyen de parvenir à l'hôpital était 12.1 ± 21,4 heures (allant de 1 à 120 heures). Moyenne était de durée de traitement anti-venin 3.2 ± 2,0 jours (entre 1 et 14 jours). Moyenne d'hospitalisation était de 4,7 ± 3,1 jours (entre 1 à 15 jours). Majorité (72,4 %) fait un bon rétablissement, la mortalité était de 4,6 % des cas et 20 (23 %) patients contre avis médical.

Conclusions : Cette étude trouvée principales variables épidémiologiques et de gestion associés à morsure de serpent. On a besoin d'un système de diffusion collection et informations données bien planifié éviter cette maladie potentiellement évitable.

Mots clés: Morsure de serpent, envenomation, anti-venins, venin de anti-serpent

Introduction

Snake bite remains major public health problems worldwide,^[1,2] and it has been estimated that in Asia alone, there are approximately four million cases per year of snake bites, of which approximately venomous snake bites account for approximately 50% of the cases with about 100,000 annual deaths.^[3-5] Snake bite remains an underestimated cause of accidental death in India,^[6,7] and it has been estimated that 200,000 persons fall prey to snake-bite annually, with an estimated fatality rate of 35,000-50,000 per year.^[6,8] Snake bite is primarily a problem of the poorer rural populations involving mainly farmers,^[7] and snake bites are not systematically reported, only very few countries possess a reliable epidemiological data on snake bites.^[1] Most of the available data are based on hospital statistics, which constitute a very small percentage of cases of snake bite.^[7,8] In this study, we present our experience with cases of snake bites managed in our tertiary care teaching center of South India.

Materials and Methods

The details of all patients with snake bite admitted to a tertiary teaching care hospital between 2010 and 2012 were retrospectively retrieved and reviewed. Ethical clearance was obtained from the Institutional Ethical Committee. The data were collected in a pre-designed proforma from the admission register and case records. The details regarding age, gender, first aid received or not, time elapsed between the bite, emergency care management and ASV administration, site of snake bite, clinical features at the time of presentation, local examination findings at the site of bite, duration of hospital stay, need of elective ventilation, details of investigations and outcome were collected. Laboratory investigations such as renal function tests, electrolytes, urine for hematuria, chest radiograph, bleeding and clotting time, arterial blood gas (ABG), and ECG were requested for and repeated when required. All patients received tetanus toxoid at the time of presentation to emergency room. All complicated snake bites were treated with polyvalent ASV. The

anti-snake venom (ASV) was administered by the intravenous route after written and informed consent. Skin test was done before starting ASV (1 ml of 1:100 diluted) was given subcutaneously.

Statistical analysis

The data were analyzed in PSP software (Free Software Foundation, Inc.) for window for statistical analysis, while standard deviation (SPSS) was applied for the continuous variables, and proportions were applied for the categorical variables.

Results

A total number of 87 patients with snake bites were reviewed [Table 1, Figure 1].

The mean age was 38.4 ± 14.8 years (range 4-70 years). There were 72 (82.8%) farmers, while 15 (17.2%) were non-farmers. In 75 (86.2%) of the patients, the site of bite was in the lower limbs, 10.3% in upper limbs and in 3.4% cases, it was in the head and neck region. Two patients had seizures. Snake could be identified in only 20 cases [Cobra- 12 (60%), Krait-2 (10%), and Viper-6 (30%)]. Majority of the patients were conscious (73.6%) at the time of presentation to emergency room, and 26.4% had altered sensorium. Fourteen (16.1%) patients had tachycardia at the time of presentation (Pulse rate > 100/minute) and in majority (83.9%), it was within normal range (60-100/minute). Twenty-four patients had ptosis (27.5%), 28 (32.2%) patients had hemorrhagic manifestations at the time of presentation, 10 patients had vomiting, 7 patients had blurring of vision, 4 patients each had abdominal pain and diplopia. At the time of presentation, 56.3%

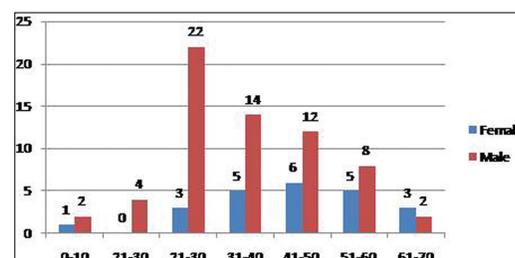


Figure 1: Age and sex distribution

Table 1: Summary of the demographic details, clinical features of snake bite patients

Sex	
• Male	64 (73.6%)
• Female	23 (26.4%)
Occupation	
• Farmer	72 (82.8%)
• Non-farmer	15 (17.2%)
Bite site	
• Head	3 (3.4%)
• Lower limb	75 (86.2%)
• Upper limb	9 (10.3%)
Consciousness	
• Altered sensorium	23 (26.4%)
• Conscious	64 (73.6%)
Pulse	
• < 100	73 (83.9%)
• > 100	14 (16.1%)
Hemorrhage	
• No	59 (67.8%)
• Yes	28 (32.2%)
Ptosis	
• Absent	63 (72.4%)
• Present	24 (27.6%)
Local cellulitis	
• No	38 (43.7%)
• Yes	49 (56.3%)
Outcome	
• Alive	63 (72.4%)
• Dead	4 (4.6%)
• Left against medical advice (LAMA)	20 (23%)

had cellulitis. Three patients were febrile at the time of admission. All three had leukocytosis, and two had evidence of cellulitis. Pupils were normal in size and reaction to light in all the patients, except three who had dilated and non-reacting pupils. Out of these, two improved and one was discharged against medical advice. There was leukocytosis in 47 cases (54%) at the time of admission. Serum urea was raised in 23% and was normal in 77% of cases. Serum sodium was normal at the time of admission in majority (90.8%), 4 patients each had hypernatremia (4.6%) and hyponatremia (4.6%). Serum potassium was normal in all the cases. Platelets were within normal range in majority (82.8%); however, 15 cases (17.2%) had thrombocytopenia. Prothrombin time was normal in 60 (69%) and was increased in 27 cases (31%). INR was increased in 10 cases (11.5%) and was normal in 77 cases (88.5%). Except in one case, bleeding time was normal in majority (98.9%). Clotting time was abnormal in 4 cases (4.6%). Urine myoglobin was present in 34.5% of patients. Two patients had oxygen saturation less than 90% at the time of admission. Arterial blood gas analysis showed acidosis in 5 cases (5.7%), alkalosis in 2 cases (2.3%), and it was normal in 80 cases (92%). Six patients had evidence of acute kidney injury at the time of discharge, and all received dialysis. CT

scan brain showed infarction and hemorrhage in two cases each. Sixteen patients (18.4%) needed elective ventilation. Mean time to reach to hospital was 12.1 ± 21.4 hours (range 1-120 hours). Mean anti-venom therapy duration was 3.15 ± 2.0 days (range 1-14 days). Mean hospital stay was 4.7 ± 3.1 days (range 1-15 days). Majority (72.4%) made good recovery; mortality was in 4.6% of cases, and 20 (23%) patients were discharged against medical advice.

Discussion

It has been recognized time and again in most of the studies that majority of the snake bite victims were young adult males in second to fourth decades of life.^[2,6,7,9-26] In this study, the predominance of male gender and farmers put them at increased risk because of their involvement in outdoor activities.^[2,6,7,9-26] Although the identification of snake species is crucial for optimal clinical management,^[5] unfortunately, in many cases, it may not be possible or the identification and or description can be misleading.^[9,27-31] We also noticed that lack of information was due to the fact that the patients were anxious and frightened, thus clouding their ability to identify the species,^[9] ignorance, or poor visibility in darkness making the identification difficult and inability to spot the snake due to tall grass and crops.^[7] Majority of the patients could reach the hospital and got primary treatment within 12 hours of snake bite incidence. In the scientific literature, the mean time taken by the patients to receive hospital care ranged from 0.5 to 10 h.^[2,11,17,25,26,31-33] Early reporting to the hospital may reflect the proximity of health care facilities and better connectivity by roads in our area. Delayed arrival to the hospital could be one of the major causes of increase mortality. Factors that could delay seeking health care include lack of transport facilities and inability to afford transportation,^[34] trying traditional and folk medicine first rather than coming to the health care facilities.^[31,32] The mortality rate from snake bite is low,^[14] and if the victim is treated without losing too much time, this mortality is potentially preventable.^[3,23,32] In a study from Malaysia, it was recognized that the majority of the snake bite cases were due to non-venomous snakes, but the venomous bites were the cause of significant morbidity and mortality.^[9] Cobra bites can result in severe envenomation with local gangrene and significantly less chances of complete recovery than those with non-cobra bites.^[9] But, a positive point here is that, even bites of venomous snakes are often not life-threatening for humans unless a sufficient amount of venom is injected at the time of the bite. Most of the bites could be dry bites, because they

were defensive, resulting in insufficient amount of venom injection.^[31] Intravenous snake anti-venom is the most effective treatment for envenoming by snakes.^[35] Administration of snake anti-venom either monovalent or polyvalent^[2,7,11,23,26,27,36-39] and accessibility to hospital care within hours of the snake bite is the major factor for good outcome.^[18,23,26,27] The majority of the rural people do not seek medical attention contributing to increased morbidity and mortality from snake bites,^[4,40] and this may be because of lack of awareness, lack of availability of snake anti-venoms, lack of transport facilities, and inability to afford transportation.^[2,14,17] To overcome this, it has been suggested that snake anti-venin should be made available free of cost, particularly in the remote rural areas.^[18] Also, at the community level, inappropriate first-aid measures such as incision, suction, and herbal treatment should be discouraged, as these not only result in mismanagement but also result in loss of vital time in seeking medical attention.^[41,42]

Increase in snake bite cases is mainly seen during the monsoon season when there is rainfall and increase in harvesting activities.^[3,12-14,18,19,22-24,43-49] As in this study, majority of the snake bites involved the lower extremities, and it can be explained by the fact that most of the time, the snakes are trodden upon by the victims.^[2,12-14,31-33,48-51] Also, many other outfield activities including fishing, plantation, wood collection, or tending crops or gardens where fairly a large number of people walk bare-footed, particularly in rural areas, there is increased risk of snake bite.^[12,18] These facts emphasize that not only there should be focus on strengthening surveillance to allow a more accurate perception of the magnitude of the problem and aggressive management of snake bite victims,^[38,41,46,52] but also there is a need to develop preventive strategies.^[5] Awareness and knowledge regarding prevention, particularly among farmers and field workers, should be disseminated,^[5,14] and they should be advised not to disturb snakes, not to walk bare footed, and use protective boots,^[5,6,11,53] to use a torch while walking on footpaths at night,^[53] sleeping on a cot (rather than on the floor) and under bed nets.^[54,55]

Conclusions

It has been recognized that hospital statistics on snake bites can underestimate the true burden.^[7] In agreement with the literature, the findings of the present analysis emphasize the importance of early report to the hospital and aggressive management of snake bite victims to avoid morbidity and mortality.^[32] We also recommend that there is a need for a well-planned data collection and information dissemination system to avoid this avoidable and preventable disease.

Although the present study is able to identify major epidemiological and management variables related to snake bite, the major limitation of the present study is that this is a retrospective chart review and some of the important data may be incomplete or insufficient, thus may not reflect the exact statistics.

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