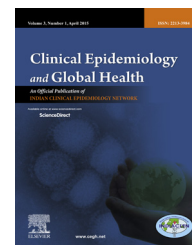


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/cegh](http://www.elsevier.com/locate/cegh)

## Original Article

# Epidemiological profile and management of snakebite cases – A cross sectional study from Himachal Pradesh, India

Anadi Gupt<sup>a,b</sup>, Tarun Bhatnagar<sup>a,\*</sup>, B.N. Murthy<sup>a</sup><sup>a</sup>ICMR School of Public Health, National Institute of Epidemiology, Indian Council of Medical Research, Chennai, India<sup>b</sup>National Health Mission, Government of Himachal Pradesh, Shimla, Himachal Pradesh, India

## ARTICLE INFO

## Article history:

Received 15 September 2015

Accepted 19 November 2015

## Keywords:

Snakebite

Envenoming

Antisnake venom

## ABSTRACT

**Background/objectives:** Snakebite envenomings are an important but neglected public health problem. Our objectives were to describe the clinico-epidemiological profile and management practices of snakebite cases in Himachal Pradesh, India.

**Methods:** We did a cross-sectional analysis of data extracted from the records of snakebite cases (2008–2012) in Zonal Hospital, Solan, Himachal Pradesh. We estimated time trends, age/sex distribution of cases, and distribution of bites by colour of snake. We categorised the clinical manifestations into syndromes. Cases with locally toxic, haemotoxic or neurotoxic manifestations were classified as poisonous bites. Amongst the poisonous cases, we analysed trends in use of vials of antisnake venom (ASV) and its clinical outcomes and financial implications.

**Results:** Of the total 497 snakebites reported during 5 years, cases increased from 77/55,784 (0.14%) total hospital admissions in 2008 to 110/68,770 (0.16%) in 2012, 73% occurred in rainy season (July–September), and 266 (54%) amongst females. Colour of snake was recorded in 159 (32%) of which 122 (77%) were green. In all, 171 (34%) were poisonous out of which 96 (56%) were haemotoxic. Cases of poisonous bites decreased from 42 (2008) to 17 (2012). Out of 25 referred envenomings, 2 (8%) were given ASV at peripheral institutes. Use of ASV vials decreased from 747 (2008) to 71 (2012), with a corresponding reduction of 73% in the expenditure on ASV per cured patient. Cure rate remained above 70%. Five (3%) poisonous snakebite cases died.

**Conclusions:** Effective management of snakebites would include appropriate ASV use and production of monovalent antitoxin as per predominance of specific species of snakes.

© 2015 INDIACLEN. Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.

\* Corresponding author at: ICMR School of Public Health, National Institute of Epidemiology, Indian Council of Medical Research, TNHB, Ayapakkam, Chennai, 600077, India. Tel.: +91 44 26136211.

E-mail address: [tarunbhatnagar@nie.gov.in](mailto:tarunbhatnagar@nie.gov.in) (T. Bhatnagar).

<http://dx.doi.org/10.1016/j.cegh.2015.11.007>

2213-3984/© 2015 INDIACLEN. Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.

## 1. Introduction

Envenoming from snakebites is a neglected but important public health problem in rural areas of South Asia, South-East Asia and sub-Saharan Africa.<sup>1</sup> Snakebites are more commonly seen in poorer sections of the population.<sup>2</sup> There is a wide variation in the estimates of morbidity and mortality due to snakebites. World Health Organization (WHO) estimates the problem as 421,000 envenomings and 20,000 deaths per annum. The same report also suggests that the burden may be as high as 1,841,000 envenomings and 94,000 deaths globally.<sup>1</sup> India is reported to have the highest number of deaths due to snakebites in the world.<sup>3</sup> In India 119,368 envenomings and 1559 deaths per annum were reported in 2011.<sup>4</sup> Mohapatra et al.<sup>3</sup> estimated the snakebite mortality in India to the extent of 45,900. Himachal Pradesh has reported 1095 envenomings and 40 deaths per annum,<sup>4</sup> which as per estimates maybe as high as 208 deaths per annum.<sup>5</sup>

In India, 236 species of snakes have been reported.<sup>6</sup> These include the front-fanged venomous snakes of the families Elapidae and Viperidae. Viperidae are represented by true vipers and pit vipers.<sup>7</sup> Green Pit Vipers are commonly found in the hilly regions of India.<sup>6</sup> The family Elapidae has 17 species, which includes Cobras, King Cobras, Kraits and Coral Snakes. The spectacled Cobra (*Naja naja*) is one of the commonest snakes in India. Monocellate Cobra (*Naja kaouthia*) is seen in the Northern and North-Eastern Parts of India.<sup>7</sup> Kraits are nocturnal snakes, which enter human dwelling at night in search of prey and many victims are bitten in their sleep.<sup>6</sup> The prevalence of different snakes varies in different geographical parts of the country. As a result, the clinical manifestations and management practices vary.

WHO prescribes a standard protocol for treating snakebites in South East countries.<sup>8</sup> Whilst a national protocol for management of snakebites in India is also in place,<sup>9</sup> some states have developed their own protocols.<sup>10</sup> These protocols are not followed strictly which may lead to inappropriate management and irrational use of antivenom (ASV). ASV is a scarce and costly commodity.<sup>11</sup> Both monovalent and polyvalent ASVs are available. In the rural tropics, victims are often bitten in an agricultural field or jungle, and in many instances the biting species is not identified. In such situations, treatment with polyvalent rather than monovalent ASV may be more appropriate. Central Research Institute (CRI) in Himachal Pradesh produces a polyvalent ASV, which has antivenoms against Cobra, Russell's viper, Common Krait and Saw Scaled Viper mostly used at Zonal Hospital, Solan.<sup>12</sup> This ASV does not contain antivenom against Green Pit Viper. There is a need to understand venom composition as per the geographic variation in species. ASVs should be designed against medically important species in India.<sup>13</sup> The data on the epidemiology of snakebites are sparse in India.<sup>14</sup> Information about the types of snakes and management of snakebites is pertinent to ensure the appropriate use of ASV. We describe the epidemiological profile, clinical manifestations and management practices of snakebites in the hilly, north Indian state of Himachal Pradesh in India.

## 2. Methods

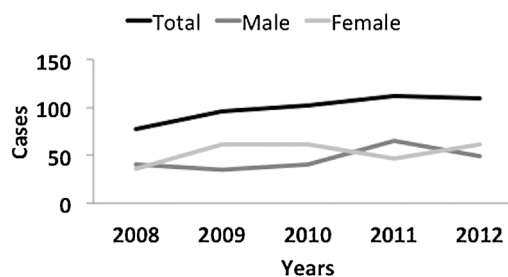
We conducted a cross-sectional study amongst the snakebite cases at Zonal Hospital, Solan, Himachal Pradesh. We scrutinised the admission and death registers of the indoor and emergency departments. We extracted the treatment records of cases of snakebite admitted to the hospital, between January 2008 and December 2012. We analysed the monthly and yearly trends of occurrence of snakebites, the characteristics of the cases and colour of the snakes.

Locally toxic, haemotoxic, or neurotoxic bites were classified as poisonous bites.<sup>8</sup> We classified bites having any of the manifestation such as local swelling, bullae, local necrosis or gangrene as locally toxic bites. The bites having any of the following manifestations – whole blood clotting time (WBCT) of more than 20 min, haematuria, epistaxis, hypotension, ecchymosis, sub-conjunctival bleed, haematemesis or encephalopathy – were classified as haemotoxic bites. Those having ptosis, diplopia, convulsions, dysphagia or inability to speak were classified as neurotoxic bites.

We described the management practices amongst the poisonous cases in relation to the use of ASV. We calculated the cure rates, case fatality rates, proportions of referral to higher institutions and proportions of patients, who had left against medical advice. We described the reasons of referral to higher institutions as proportions. We calculated the median time of hospital stay by type of bites. We analysed the data using Microsoft Excel 10 and Epi Info software, version 3.5.3.

## 3. Results

A total of 497 cases of snakebites were admitted from 2008 to 2012 at the Zonal Hospital, Solan. The reporting of snakebite cases increased from 77/55,784 (0.14%) total hospital admissions in 2008 to 110/68,770 (0.16%) in 2012 (Fig. 1). Of all the snakebites in a year, 63–83% occurred in the months of July–September (Fig. 2). Two hundred sixty-six (54%) of all cases were females, amongst whom 126 (48%) were 20–39 years old. Of 231 males, 112 (49%) were 10–29 years old (Table 1). Of all the bites, left hand was bitten 28% of the times, left foot 20%, right hand 19%, and right foot 18%. Amongst 171 poisonous snakebites, 67 (39%) were on the upper extremities of either side (Table 2). Each year, 92–96% cases were reported from rural areas. The median time to reach the hospital after



**Fig. 1 – Yearly trend of snakebite cases admitted in Zonal Hospital, Solan, Himachal Pradesh, India, 2008–2012 (N = 497).**

Download English Version:

<https://daneshyari.com/en/article/3396323>

Download Persian Version:

<https://daneshyari.com/article/3396323>

[Daneshyari.com](https://daneshyari.com)