Abstract

Snakebite is an important cause of morbidity and mortality in the rural areas of Sri Lanka, especially in the district of Anuradhapura. In the year 2001, the hospital admission rate for snakebite for the whole country was 207 per 100,000 population and the mortality rate was 0.8 per 100,000 population, while the figures for Anuradhapura were 605 per 100,000 and 1.7 per 100,000, respectively. Previous studies have identified that many deaths and increased morbidity are due to delays in seeking medical care. This may be due to lack of knowledge of the severity of the bite of different types of snakes and to resorting to alternative treatment before hospital admission. Hitherto, attempts to reduce mortality have been mainly directed towards improved clinical care, which is reflected in the marked reduction in case fatality rates. Mortality as well as length of hospitalization and secondary complications could be significantly reduced if people are encouraged to come early for treatment and to refrain from negative injurious practices following snakebite. Therefore, the present study was planned with the objective of estimating the community incidence of snakebite in two selected Divisional Secretariat Divisions of the Anuradhapura District. Knowledge and practices related to snakebite were described and a community-based intervention to improve knowledge and good practices following snakebite was implemented and evaluated.

The study was carried out in two phases. The first phase was a community survey to identify all snakebites in selected villages and to describe health-seeking behaviour related to the bites identified. A cross sectional study design was used to collect retrospective data over a period of one year. Based on the results of this phase, a community based intervention consisting of an educational programme to improve knowledge of the prevention of snakebite and of good practices following snakebite was planned. The establishment of a first aid centre in each intervention village was also a part of the intervention. One of the two divisional secretariat areas identified in the first phase was randomly selected as the intervention area while the second served as the control area.

Changes in community knowledge, incidence of snakebite and practices following snakebite, pre and post interventions were compared in the intervention and control areas. Information was also collected on the utilization of the first aid facility by the people.

Incidence of snakebite was 1780 per 100,000 population and the incidence of venomous snakebite was 838 per 100,000 population. In 23% of the bites, the offending snake was unidentified. Forty five percent of all snakebites and 97% of venomous bites were caused by the Russell's viper, common krait and hump-nosed viper. The majority of bites caused by the Russell's viper and hump nosed viper (84.8% and 68.9%, respectively) were in the age group 20-49 years while bites of the common krait were distributed over all age groups.

The maximum number of venomous bites reported was for the month of July 2000. This coincided with the onset of the harvesting season and also corresponded to months with low rainfall. The bites of the Russell's viper and hump-nosed viper are associated with rainfall, the bites increasing during months of no or low rainfall.

Most bites caused by the common krait have taken place at night and within the home while the victim was sleeping, while the Russell's viper and hump nosed viper bites have occurred outside the home and while the victim was working. The Russell's viper bites were predominantly associated with agricultural activity while the hump-nosed viper bites have occurred both in the house and in the field.

Ayurvedic treatment was sought in 20% of cases where the offending snake was identified as venomous. This percentage was higher (29%) among those reporting krait bites.

The average cost (for all bites) was calculated to be Rs.815, but it is seen that the costs incurred by Russell's viper victims (Rs.1505) were higher than for bites of other venomous snakes. When the expenditure was disaggregated into the specific items, the cost to the family/victim was mainly due to the loss of daily income.

Certain characteristics related to snakebite were used to develop a model capable of differentiating between venomous and non-venomous snakebite. The discriminant function model was used to reclassify the 48 unidentified snakebites into venomous and non-venomous groups. The adjusted incidence of venomous snakebites in the study area therefore is 1089 per 100,000 population.

The pre and post intervention comparison in the second phase showed a marked improvement in the visual identification of venomous snakes especially the identification of the common krait in the intervention area (from 17.5% to 72.1%). There were marked improvements in knowledge of preventive measures and in good practices following snakebite (40%) in the intervention area. The incidence of snakebite had increased in both intervention and control areas but this increase was noted to be more especially in the incidence of venomous bites in the intervention area.

The incidence of snakebite as determined by the study was much higher than that suggested by hospital-based morbidity data. However, epidemiological features such as the type of snake, age group affected, seasonality and circumstances of bites were similar to those reported in hospital-based studies. The practices and health-seeking behaviour identified have an important influence on the outcome and there were aspects that were amenable to correction. The intervention decreased the negative practices and improved the positive practices highlighting the fact that a relatively low cost intervention in the community could make a difference. The increased incidence of snakebite noted over and above that of the control area was probably due to increased sensitization of persons and reporting of events. A decrease in bite rates through education could be achieved only over a long period of time.