

PREVALENCE OF SNAKE BITES IN KANGAR DISTRICT HOSPITAL, PERLIS, WEST MALAYSIA: A RETROSPECTIVE STUDY (JANUARY 1999-DECEMBER 2000)

Jamaiah I¹, Rohela M¹, Roshalina R² and Undan RC²

¹Department of Parasitology, Faculty of Medicine, University Malaya Medical Center, Kuala Lumpur;

²Medical students phase 11, Session 2001/2002, Faculty of Medicine, University Malaya Medical Center, Kuala Lumpur, Malaysia

Abstract. The records of 284 snake bite cases presenting to the Kangar District Hospital, Perlis, West Malaysia, from January 1999 till December 2000 were carefully reviewed. Data on prevalence and types of snake bites, were recorded. The majority of the cases were among Malays (60.2%), followed by Chinese (16.9%), Indians (13%), and others which include Thai nationals, army personnel from Sabah and Sarawak, and foreign tourists (9.8%). A higher incidence was found in males (60.2%) and most cases were seen in the age group of 10-19 years (33%). Snake bites were more common between 2 PM and 9 PM (47.6%) and from 7 AM to 2 PM (33.4%). The snakes were positively identified in 68 cases, of which 50 were common cobras (*Naja naja*) (73%), 16 were Malayan pit vipers (*Agkistrodon rhodostoma*) (24%) and two were sea-snakes (3%).

INTRODUCTION

Most snakes are harmless to human. In Malaysia, 17 of the 105 strictly land snakes are venomous and are dangerous to man. These venomous snakes divided into two families, the Elapidae (9 species) and the Viperidae (8 species). All 14 species of fresh-water snakes are harmless but all 22 species of sea-snakes are venomous (Lim, 1990).

Most of the cases of snake bites in Malaysia are due to the Malayan pit viper (*Agkistrodon rhodostoma*) (Reid *et al*, 1963; Lim and Abu Bakar, 1970; Muthusamy, 1988; Lim, 1990). The distribution of this snake is confined to Kedah and Perlis in the northern part of West Malaysia; extending into southern Thailand (Reid *et al*, 1963; Lim and Abu Bakar, 1970; Muthusamy, 1988; Lim, 1990). Reid *et al* (1963) reported 15,919 cases of snake bites from 1960-1968 in the 11 states of West Malaysia. The majority of the cases (74%) were from the four northern states of Peninsular Malaysia. Malayan pit vipers were responsible for 85% of the snake bite cases in Perlis and Kedah (Reid *et*

al, 1963; Lim and Abu Bakar, 1970; Lim, 1990). Lim and Abu Bakar (1970) reported an average of 29 cases of snake bite per month admitted to Sungei Petani District Hospital. At Alor Star Hospital, he reported an average of 30-35 cases per month. Most of these bites were due to the Malayan pit viper.

Muthusamy (1988) did a retrospective study of 224 cases of snake bite at Bukit Mertajam Hospital over a two-year period and found that snake bites formed 0.5% of the total admissions and 1.7% of the Medical and Pediatric admissions; accounted for 0.3% of the total hospital deaths.

Tan *et al* (1990) reported that elapid bites were more common than viper bites among 83 children admitted with snake bites to Kota Bharu General Hospital and University Hospital Sains Malaysia over a 5-year period.

Trishnananda (1979) reported that bites by cobras have a higher incidence in Thailand and in the Philippines with higher case-fatality rates. Bites by Malayan pit vipers are also important in Thailand because of their high incidence. Bites by sea snakes are more common in Malaysia than in the Philippines and Thailand.

Reid (1975), reported a series of 101 patients bitten by sea-snakes in Malaya (1957-64), where (80%) were fisherman. Bathers and divers were

Correspondence: I Jamaiah, Department of Parasitology, Faculty of Medicine, University Malaya Medical Center, Kuala Lumpur 50603, Malaysia.
Tel: 03-7967 4752; Fax: 03-7967 4754
E-mail: jamaiah@ummc.edu.my

Table 1
Prevalence of snake bites at the Kangar District Hospital by age, sex, and race (Jan 1999- Dec 2000).

Age (Years)	Race								Total (%)
	Malay		Chinese		Indian		Others		
	M	F	M	F	M	F	M	F	
0-9	6	8	0	4	0	2	0	0	20 (7%)
10-19	54	24	3	1	5	5	1	0	93 (33%)
20-29	6	3	11	7	8	2	12	0	49 (17%)
30-39	9	5	9	1	7	1	5	3	40 (14%)
40-49	4	6	0	0	3	2	0	1	16 (6%)
50-59	8	11	6	2	1	0	1	2	31 (11%)
60-69	5	10	0	3	0	1	1	2	22 (8%)
>70	5	7	1	0	0	0	0	0	13 (5%)
Total	97	74	30	18	24	13	20	8	284
(%)	60.2%		16.9%		13%		9.8%		

occasionally bitten.

Pierini *et al* (1996) reported that snake bite is an important cause of morbidity and death among forest-dwelling Amazonian Indians and rubber tappers in north-western Brazil. Overall, 13% of a surveyed population had been bitten during their lifetime.

Rudolph *et al* (1995) reported that the majority of snake-bite cases from southeastern Georgia were due to rattlesnake (30%) and an average of 6 snake bites were treated each year. Snow *et al* (1994) reported that snake-bite mortality among a rural population in Kenya was estimated to be 6.7/100,000 people each year, representing 0.7% of all deaths. Wilkinson (1994) reviewed 81 patients admitted with snake bite to a rural hospital in Zululand and found that 30% of the bites occurred at night. Snake bites in Zululand caused significant morbidity and mortality.

No recent data on snake bites have been reported from Malaysia. As most cases of snake bites in the country were reported from the northern states of West Malaysia, the aim of this study was to find out the prevalence of snake-bite cases admitted to the Kangar District Hospital, which is situated in the northern most state of Peninsular Malaysia, bordering southern Thailand.

MATERIALS AND METHODS

All the case notes of patients with snake bites

at the Kangar District Hospital, Perlis, between January 1999 and December 2000 were reviewed. Out of 284 cases of snake bites, 203 (71.5%) were admitted.

RESULTS

Table 1 shows that the majority of the cases of snake bite occurred among the Malays (60.2%), followed by the Chinese (16.9%), Indians (13%), and others (9.8%), which include Thai nationals, army personnel from Sabah and Sarawak, and foreign tourists. From Table 1, we can see that the majority of the cases occurred in males (60.2%) and within the age group of 10-19 years of age (33%).

Most of the bites occurred between 2.00 PM and 9.00 PM (47.6%) and between 7.00 AM and 2.00 PM (33.4%).

Table 2 shows that only 68 (24%) of the cases were positively identified, of which 50 (73%) were common cobras (*Naja naja*), 16 (24%) were Malayan pit vipers (*Agkistrodon rhodostoma*) and two (3%) were sea-snakes. No documentation on patients' occupations and the number of deaths was recorded in the case notes. No seasonal patterns of snake bites were noted. The wet season, from November to February, was not associated with an increased risk of snake bite.

The treatment given consisted of giving intravenous antivenom, prophylactic antihistamine,

Table 2
Types of snake bites that were positively identified.

Types of snakes	Number	Percentages (%)
Common cobras (<i>Naja naja</i>)	50	73
Malayan pit viper (<i>Agkistrodon rhodostoma</i>)	16	24
Sea-snakes	2	3
Total	68	100

hydrocortisone, antibiotics, and intramuscular antitetanus toxoid as prophylaxis against tetanus infection. Debridement was performed on patients with extensive local necrosis. Incision and drainage was performed on patients who developed abscesses at the site of the bite.

DISCUSSION

Although Reid *et al* (1963), Lim and Abu Bakar (1970), Trishnananda (1979), Muthusamy (1988), and Tweedie (1990) reported that most cases of snake bites in northern Peninsular Malaysia were due to the Malayan pit viper, this study showed that most of the bites were due to the cobras. In that study, only 24% of the snakes were positively identified.

Perlis, the northern-most state of Peninsular West Malaysia is mainly an agricultural state, although fishing is also an important occupation. Both farming and fishing are known occupational hazards associated with an increased risk of snake bite in adults. The Malayan pit viper is a lowland snake and is common in primary and secondary forests, rice fields, and rubber and oil palm estates. It feeds on frogs, lizards, and small mammals. This snake is found on the forest floor, taking shelter in between roots of trees, underneath logs and also among heaps of dried leaves. In the rubber and oil palm estates, it is found on the ground or at the base of rubber and oil palm trees. In rice fields, it is found commonly in the straw during harvest when rats are abundant. Most victims of the Malayan pit viper were rubber tappers, oil palm estate workers, farmers in rice fields and people using the forest paths (Lim and Abu Bakar, 1970).

Tweedie (1990) and Reid (1995) reported that sea-snakes occur in great abundance and variety along the coasts of Malaysia. Most lived in shallow coastal waters. Sea-snake venom is very powerful and is dangerous to human life. People most at risk for being bitten are fisherman; who catch them in nets in shallow water (Reid *et al*, 1963; Lim and Abu Bakar, 1970; Reid, 1975; Trishnananda, 1979; Tweedie, 1990). In this study only two sea-snake bites were recorded. Reid (1975) and Tweedie (1990) reported that the beaked sea-snake (*Enhydrina schistosa*) is the commonest and the most dangerous sea-snake and is found all along the coast and in the river mouths of Peninsular Malaysia. Seven out of the eight fatal bites were due to this species.

In Malaysia, cobras (the most common species found in this study) are of two types: the king cobra (*Ophiophagus hannah*) and the common cobra (*Naja naja*) (Reid *et al*, 1963; Lim and Abu Bakar, 1970; Lim, 1990; Tweedie, 1990). Tweedie (1990) reported that not many cobra bites are recorded in Malaysia, because both are active snakes that keep out of peoples' ways. King cobras feed on other snakes and common cobras feed on birds, lizards, small mammals, rats, and frogs. They are not aggressive (Reid *et al*, 1963; Lim and Abu Bakar, 1970; Lim, 1990; Tweedie, 1990). They will only attack when provoked or accidentally stepped on. Frog hunters at night are the common victims of the bite of the common cobras (Lim and Abu Bakar, 1970).

The majority of the population in Perlis are Malays and the majority of the Malays live in rural areas and work as padi farmers, rubber tappers and fisherman. They are the most vulnerable to snake bites. As shown in this study the majority of the cases were among the Malays. The majority of the cases were in a young age group (10-19). This is the most active age group. Males were bitten more often. A similar trend has been reported in other hospitals in Malaysia, and in some Asian and Southeast Asian countries (Muthusamy, 1988; Silveira and Nishioka, 1995; Gopalakrishnakone *et al*, 1990).

Pierini *et al* (1996) reported that 93% of snake bite victims seek traditional treatment and the majority (80%) of them recovered fully. Rudolph *et al* (1995) reported that patients with

snake bites developed anaphylaxis from the antivenom given. Silveira and Nishioka Sde (1995) recommended that antivenom administration is not indicated for victims of snake bite presenting with no manifestations of local or systemic envenoming. Muthusamy (1988) reported that the majority of the patients were treated with simple analgesics, bed rest and tranquilizers for anxiety. Only 5.4% of the patients were given anti-venom. None of the patients developed anaphylactic reactions. The indication for giving antivenom is when cases have clinical evidence of envenomation.

The venom of cobras is neurotoxic and can cause respiratory paralysis, cardiotoxicity leading to arrhythmias and, acute heart failure, in addition to local necrosis at the site of the bite. A cobra's bite must be treated as an acute emergency. The current management of a cobra's bite is artificial respiration and ventilatory support in addition to specific antivenom therapy (Gopalakrishnakone *et al*, 1990).

The venom of Malayan pit vipers contains powerful coagulants that cause consumption coagulopathy and defibrination; it also causes local swelling, blister formation and necrosis. Asian pit viper bites are usually not lethal. The current treatment includes specific antivenom therapy and supportive care. The large blisters, local necrosis and extensive swelling may call for fasciotomy and surgical debridement (Gopalakrishnakone *et al*, 1990). Sea-snake venom is both neurotoxic and myotoxic; the latter effect is more prominent in human victims. Thus, sea-snake bites produce myonecrosis, myalgia, myoglobinuria, hyperkalemia and renal failure. The bite is usually painless and causes only a mild local reaction. The victims are also reported to become very sleepy and later go into a coma. Administration of polyvalent anti-sea-snake serum is the only treatment available (Gopalakrishnakone *et al*, 1990).

Precise identification of the offending snake is not possible in many instances. Various practices that are of no benefit in the treatment of snake bites are still widely used. Acute adverse reactions to antivenom serum are common. Seneviratne *et al* (2000) found that neither hydrocortisone nor antihistamines seemed to be of benefit as prophylaxis. He suggested that evidence-based management guidelines, especially in regard to the use of antivenom, are urgently required.

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