Indian Journal of Forensic Medicine and Pathology
Volume 4 Number 4, October - December 2011

Ocular Manifestations in Patients with Snakebite in Rural Western Maharashtra

Chavan W.M.*

Chavan K.D.**

ABSTRACT

This study was conducted in Pravara Rural Hospital, Loni, Tah-Rahata, Dist.-Ahemadnagar (Maharashtra) during January 2010 to December 2010. A large number of cases occur in this area because of agriculture and agriculture-related occupation. This study was aimed to know the ocular changes in snake bite. Patients admitted in intensive care unit (ICU) due to snake bite were considered for the study. Detailed ocular examination of these patients was carried out by torch, ophthalmoscope and other ophthalmic instruments. For this study, a total 78 patients were examined. Out of 78, cases 38 (48.78%) cases were having bilateral ptosis. Out of 38 cases of bilateral ptosis, 13 (34.21%) were of Krait, 15 (39.47%) cases were of Cobra. In 10 (26.35%) cases of ptosis, type of snake could not be identified. In 30 (38.46%) cases visual acuity was reduced.

Key words: Snake bite; Ocular manifestation; Western Maharashtra.

INTRODUCTION

Snake bite is a major problem in the world. It is a neglected problem in tropics due to lack of antisnake venom. Snake bite is a bigger problem in rural India. It is one of the main causes for morbidity and mortality. There are 2500 species of snakes in the world. Out of that 216 species are present in India. Common poisonous snakes seen in India are Cobra, Krait and Viper. Snake bites cause two types of effects- 1) vasculotoxic and 2) neurotoxic. Both these kinds cause ocular manifestations. The institute where this study was conducted is located in a rural area, so large numbers of cases occur in this area due to agriculture and agriculture-related occupation. This study aimed to know the ophthalmic changes in snake bite. Patients admitted in intensive care unit (ICU) due to snake bite were considered for the study. Detailed ocular examination of these patients was done. A total of 78 patients were studied of which 44 were male. Maximum cases of snake bites were seen between 20 to 40 years of age. In majority of cases snake bite was in the evening time. Maximum cases of bite were in the lower limb and occurred when people were working on farms. Near about equal no. of cases occurred during January to March and July to September. During the study ocular manifestations observed were bilateral ptosis and reduction in visual acuity.

Authors affiliation: *Assistant Prof. Dept of Ophthalmology, **Professor & Head, Dept of Forensic Medicine & Toxicology, Rural Medical College, Loni Dist. Ahemadnagar (Maharashtra).

Reprints requests: Dr. Chavan W.M, Assistant Prof. Dept of Ophthalmology, **Professor & Head, Dept of Forensic Medicine & Toxicology, Rural Medical College, Loni Dist. Ahemadnagar (Maharashtra).

MATERIALS AND METHOD

Patients admitted in intensive care unit of Rural Medical College, Loni, due to snake bite were considered for the study. Detailed history

of each patient was taken which included name, age, sex, occupation, time of bite, date and time of admission in hospital, information about snake, location of bite, presence of fangs of snakebite, general examination. Detail ophthalmic examination included recording of visual acuity with the help of Snellen's distant vision chart, head posture, facial symmetry, position of lids, ocular movements, size and reaction of pupil (direct and consensual), appearance of conjunctiva, transparency of cornea, fundus examination with ophthalmoscope to see retinal hemorrhages, disc oedema, recording intraocular pressure with digital tonometry or schiotz tonometer. The type of snakes were identified by showing pictures of snakes to patients. Statistical test applied for bilateral ptosis was Z test of difference between two proportions at 5% and 1% level of significance (i.e. $p<0.05$ $p<0.01$) There was significant difference between proportion of cobra and krait as compared to other type of snakes

RESULTS

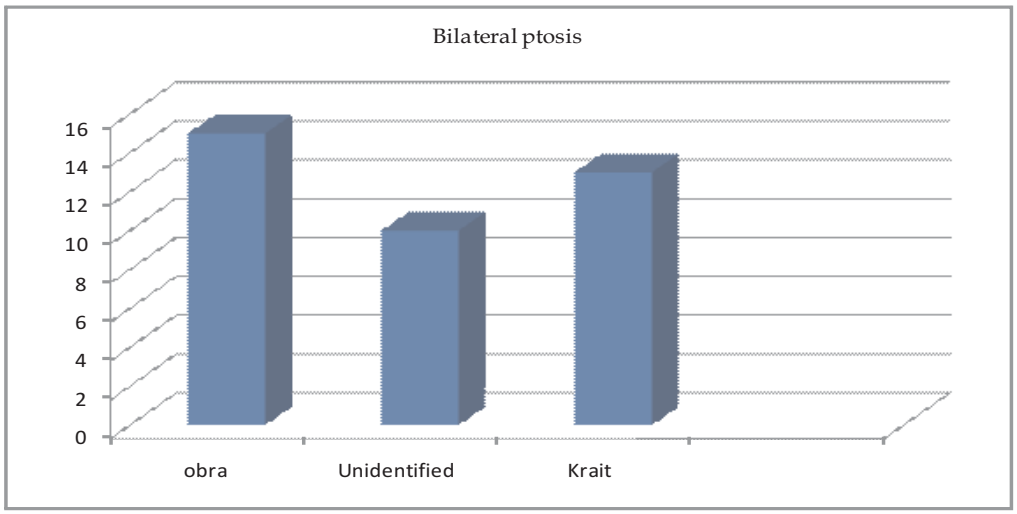
According to Table 1 out of total 78 cases 44(56.41%) were male and 34 (43.8%) were female. Maximum cases 48 (61.43%) were between age group of 20 to 40 years of age group followed by 18 (23.07%) cases of age group above 40 years while less cases 12 (15.38%) were below 20 years of age. Hence median age was 38 years. Near about 60 (89.7%) cases of snake bite occurred in agricultural workers where as 18 (23.03%) cases were in nonagricultural persons. As regards timing of bite, more cases 42 (53.84%) were during evening as compared to 36 (46.15%) cases during daytime. More bites 58 (74.35%) were on lower limb as compared to 20 (25.64%) in upper limb. About equal number of cases, 28, (35.8%) occurred in January to March and 29 (37.17%) cases during July to September followed by 15 (19.23%) cases during April to June, followed by 6 (7.69%) cases during October .to December. In relation to place of bite, 52 (66.66%) cases occurred in field as compared to 26 (33.33%) in home. In 30 (38.43%) cases of snake bite, type of snake was identified in which 2 (6.66%) were viper, 13 (43.33%) were Krait and 15 (50%) were Cobra. Out of 78 cases in 38 (48.73%) cases there was bilateral ptosis. Out of 38 cases of bilateral ptosis, 13 (34.21%) cases were of Krait.15 (39.47%) cases were of Cobra. In 10 (26.31%) cases of ptosis type of snake could not identified. In 30 (38.46%) cases visual acuity was reduced.

Table 1. Sociodemographic profile of study population

Age	**Study population**
below 20 Years	12 (15.18 %)
20—40 years Above 40	48(61.53%)
years age	18(23.07%)
Sex	44(46.41%)
Male	34 (43.08%)
Female	
Occupation	60(76.92%)
Agriculture	18(23.07%)
Nonagricultural	
Timing of bite	42(53.84%)
Evening time	36(46.15%)
Day time	
Site of bite	58(74.03%)
Lower limb	20(25.06%)
Upper limb	
Season	28(35.86%)
January to March	15(19.23%)
April to June	29(37.17%)
July to September	06(7.69%)
October to December	
	26(33.33%)
Place of bite	52(66.66%)
Bite in home	
Bite in &around field	
Type of snake	
Vipers	02(6.66%)
Krait	13(43.33%)
Cobra	15(50.06%)

Table 2. Distribution of cases according to ocular manifestation

Type of snake	Bilateral ptosis (48.78% cases)	Extra ocular muscle paralysis	Optic Neuritis	Optic atrophy	Retinal hemorrhages	Acute angle closure glaucoma
Viper	0	0	0	0	0	0
Krait	13(34.21%)	0	0	0	0	0
Cobra	15(39.47%)	0	0	0	0	0
Unidentified Cases	10(26.35%)	0	0	0	0	0



Z test of difference between two proportions at 5% and 1% level of significance (i.e. $p<0.05$ and $p<0.01$) there is a significant difference between proportions of Cobra and Krait as compared to other types of snake.

Table 3. Distribution of cases according to visual acuity (N=78)

Visual acuity	No.	%
Normal visual acuity	48	61.53
Reduced visual acuity	30	38.41

DISCUSSION

In the present study 56.2% of participants were male while 43.8% were female, showing male dominance. This may be due to more involvement of males in agriculture work as compare to females. This observation is consistent with observation of Nuchhiudaykumar et al[1].

High incidence (61.43%) of snake bite was seen in age group of 20 to 40 years of age as this is active age for involvement in agriculture work. This observation matches with the observation of JS Whitehall et al[2].

Maximum numbers of cases (89.7%) were seen in agricultural workers. Farming community is increasingly prone to accidental

contact with the snakes while working in field. This observation is similar to that of Francis N P Monteiro et al[3]. Maximum cases (53.84%) of snake bite occurred during evening time because of nocturnal nature of snakes. Same observation was made by Hung H.T., Hojer.J[4].

As far as site of bite is concerned more cases (74.34%) were found in lower leg as agricultural workers do not wear legging and boots while working in fields. Same observation was made by Swamy and Banerjee[5].Almost equal number of cases occurred during January to March (35.8%) and July to September (37.17%). July to September is rainy season and sowing season while Janwary.to March is harvesting season. This observation is similar to JS Whitehall et al[2].

Only in 38.43% cases the type of snake could be identified .Out of that, 50.0% were cobra, 43.3% were Krait and 6.66% were Viper. JS Whitehall et al[2] could identify 32% cases of which 43% were Saw Scaled Viper, 14% were Russell Viper 6% Cobra and 6% Krait White 68% snakes were not identified .This variation may be due to the fact that one variety of snake may be more in population in a particular area.

In 38.46% cases visual acuity was reduced. There was no obvious cause for reduction of visual acuity. This reduction might be due to psychological disturbance of patients due to snake bite. Jasjit Singh et al[6] observed blurred vision in 72% case This difference is because in this study only venomous snake bites were considered.

Ptosis was the only ocular manifestation observed. It was present in 48.78% cases. JSWhitehall et al observed ptosis in 15% cases; .Jasjit Singh et al[6]. found ptosis in 77% cases. This high percentage is because only venomous snake bites were considered. In total cases of ptosis, 39.47% were due to Cobra, 34.21% were due to Krait and 26.3% were due to unidentified snakes. Statistically, there is significant difference between proportion of Cobra and Krait as compared to other type. JS Whitehall et al[2] observed ptosis in 7% cases of saw Scale Viper, 21% cases of Russell Viper, 24% cases of unidentified Viper, 17% cases of Krait, 17% cases of Cobra. This difference is due to more cases of snake bite by viper (57%). In this study, not a single case was of extraocular muscle paresis, but Mesuji Takeshita et al[7] noted one case of extraocular muscle paresis in which there was paresis of medial rectus and inferior oblique. There was no case having optic neuritis. Guttmann-Friedmann[8] noted bilateral optic neuritis as a result of severe hemorrhage following snake bite. In this study there was no severe hemorrhage in any case after a bite. In no case there was optic atrophy. Davenport and Budden[9] noted bilateral secondary optic atrophy after snake bite. In no case there was subconjuctival hemorrhage or retinal hemorrhage. According to R.C. Davenport and F.H. Budden[9] some snake venom contains anticoagulants, haemolysins, and after bite there are multiple hemorrhages in the body. There can be subconjuctival, retinal and vitreous hemorrhage. There was no case having acute angle closure glaucoma.Dr Mohd Haneef and DrVeena VA[10] noted a case of Viper bite in which patient developed acute congestive glaucoma which is a rare complication.

CONCLUSION

In rural western Maharashtra snake bite cases are more due to Cobra bite and Krait bite. Sites of bite are more in lower leg. People should be advised to wear boots while working on farms. Only neurotoxic ocular manifestation observed in venomous snake bite is ptosis. Statistically, there is significant difference between proportions of Cobra and Kraits compared to other type of snakes in regarding bilateral ptosis.

REFERENCES

1. Nuchhiudaykumar C, Shah Rajan K, Reddy KS Narayan. A study of snakebite poisoning in Gulbarga region (A five year study). *Ind J Foren Med Toxico* 2009; 3(2): 1-5.

2. JS Whitehall, Yarlini, Arunthathy, Varan, Kaanthnn Isaivanan, Vanprakash. Snakebites in north east Sri Lanka" The international Electronic. *J Rur Remo Heal Res Edu* 2007; 7(4): 751.
3. Francis NP Monteiro, Kanchan Tanuj, Bhagwath Prashntha, Kumar G, Pradeep. Epidemiology of cobra bite in Manipal, Southern India. *J Ind Accad Foren Med* 32(3): 224-227.
4. Hung HT, Hojer J, Du NT. Clinical features of 60 consecutive ice treated patients envenometed by Bungrus multicinctus. *Southeast Asian J Trop Med Public Health* 2009; 40(3): 518-24.
5. Swamy & Banargy. Poisonous snakes of India & Snake bite in India; Ahuja MS, 1st ed. *Progress in Clinical Medicine in India, 1978;* 136-179.
6. Jasjit Singh, Sanjeev Bhoi, Vineet Gupta, Ashish Gowl. Clinical profile of venomous snake bites in north Indian military Hospital. *J Emer, Trauma Shock* 2008; 1(2): 78-80.
7. Tetsuji Takeshita Kazuhiro Yamada, Masakazuu Handa, Naokoodau Odea. Extra ocular muscle paresis caused by snake bite. *Kobe J Med Sci* 2003; 49: 11-15.
8. Guttmann Friedman. Blindness after snake bite. *Brit J Ophthal* 1956; 40: 57.
9. Davenportand RC, Budden FH. Loss of sight following snake bite. *Brit J Ophthal* 1953; 37: 11.
10. Mohd Haneef, Veena Verma. Acute angle closure glaucoma: rare complication of viper bite. *KMJ* 2008; 2.