



Research Article

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Epidemiology of animal injuries: A community based study from rural area of Maharashtra

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Abstract

Background: Animal injury is being discussed globally for the reason of increased morbidities and mortalities along with challenges faced in its treatment. In India, the most of the animal injuries were treated (like snake bite, dog bite) at Government hospital due to non-availability of medicines at local medical stores. Pubmed search revealed no information on animal injuries from India. Understanding the above facts, this study was conducted with objective to understand the prevalence and patterns of animal injuries from the rural area of Maharashtra. **Methods:** It was descriptive cross-sectional, community based study, a conducted in all 24 villages under Primary Health Centre, Kharangana (Gode), dist. Wardha. The study was carried out from June 2009 to May 2011. Data was collected on socio-demographic characteristics, proportion & different types of animal injury by using pre-tested interview schedule through the house to house visit. Recall period of one year was used. **Result:** In the present study, the total 4790 subjects of all age were studied from 1100 families. Magnitude of animal injury was 84 (1.8%). The highest proportion (56%) of animal injury was in 25-59 years of age followed by 16.7% in < 14 years. Proportion of animal injury was (67%) among males as compared to (33%) females & the association of age distribution & animal injury was not statistically significant but significant association was found among gender & animal injury. Dog bite was the most common type of animal injury 33 (39.2%), followed by snake bites 20 (23.8%). **Conclusion:** We found dog bite and snake bites are major cause of animal injuries from rural area and mainly found in the productive age group of male population. There is need of community based research on types & impacts of different animal injuries in lower & middle income countries.

Keywords: Epidemiology, Animal, Injury, Community & rural.

Introduction

Animal injury is being discussed globally for the reason of increased morbidities and mortalities along with challenges faced in its treatment. Currently it was estimated by World Health Organization (WHO), that worldwide about upto 5 million snake bites and 10 million dog bites cases reported. Majority of the cases reported from Africa and South East Asia Region.^[1] Annually, 94000-125000 deaths reported due to poisoning from snake bites and 55,000 deaths reported due to rabies in which about 56% is from Asian continent and India contributing two third of this burden.^{[1],[2]}

In India, it was estimated that 20,000 deaths were seen among 17 million animal bites reported cases.^[2] As per National Crime Record bureau (NCRB), less than 1% of animal injuries were reported in India.^[3]

The health impact of animal bite was depends on the type of animal species, susceptibility of the host factors, availability of nearby health facility and trained resources for its management. In India different cases of animal injuries reported in hospitals mainly due to the bites of different species likes snakes, dogs, scorpion, pigs and monkey etc. Animal injuries are most neglected part of unintentional injuries in lower & middle income countries. In India, the most of the animal injuries were treated (like snake bite, dog bite) at Government hospital due to

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cost of medicines, non-availability of medicines at local medical stores, non availability of trained resources for its management at local level etc. Pubmed search revealed less information on animal injuries from India. Understanding the all above facts, this study was conducted with objective to study the prevalence and distribution of animal injuries from rural area of Wardha (Maharashtra).

Material & Methods

Study design

The present study was descriptive, cross sectional, a community based study conducted in all 24 villages under Primary Health Centre, Kharangana (Gode), district Wardha (Maharashtra) with a population of 34,940. The study was carried out from June 2009 to May 2011. **Sample size & sampling technique:** A pilot study was carried out in 7 villages of adjoining Primary Health Centre. The prevalence of injury came out to be 12%. Considering this as the minimal expected prevalence and 5% alpha error, 10% relative error in the estimate of prevalence and the design effect of 1.5 (because of the Multistage sampling shown in figure 1), Sample size = $(4pq / L^2) * DE$ (4400), considering the average number of members in a family to be 4, total families to be sampled were 1100. The probability proportionate to the size (PPS) of the village was used to decide the number of families to be sampled from each of the 24 villages. Required number of families from selected villages was selected by systematic random sampling.

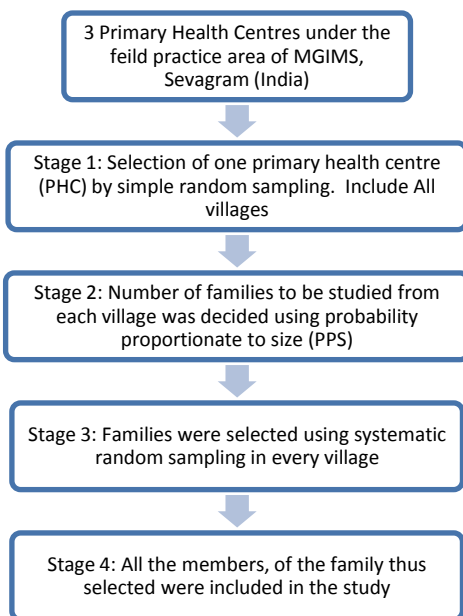


Figure 1: Multistage sampling illustrated in above figure

Ethical approval and informed consent

Ethical approval for the study was granted by the Ethics Committee of Mahatma Gandhi Institute of Medical Sciences, Sevagram District Wardha (Maharashtra, India). Verbal & written informed consent was taken from the household head

and study participants. For minors, verbal informed consent was taken from Guardians or parents.

Data collection

Data was collected on socio-demographic characteristics, proportion & different types of animal injury by using pre-tested & structured interview schedule through the house to house visits. Recall period of one year was used. Questionnaire was designed using Injury surveillance guidelines published by the WHO in 2002.^[4]

Statistical analysis

Data entry and analysis was done by using Epi_info 6.04d software package. For studying epidemiological correlates we used odds ratio, as a measure of association and 95% Confidence interval (95% CI) was also calculated. *p value* was less than 0.05 was considered as significant.

Result

In the present study, the total 4790 subjects of all age were studied. The majority of the subjects 2263 (47.2%) belonged to 25-59 years of age, 2541 (53%) were male and 1316 (27%) were below poverty level. Most of the study subjects 2498 (52.2%) were educated up to middle and secondary level (5th to 10th). The majority of the population 1416 (29.6%) were agricultural laborer. In the present study prevalence of animal injury was 1.8% (84). Percentage distribution of different types of animal injuries is shown in figure 2.

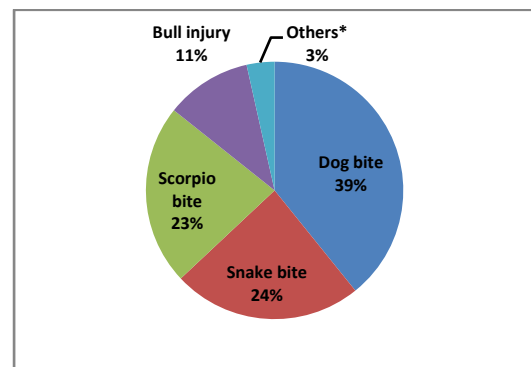


Figure 2: Animal injury according to causes; Others*-Pig bite, monkey bite

The highest proportion (56%) of animal injury was in 25-59 years of age followed by 16.7% in < 14 years. It was minimum in the age group of > 60 years. The odds of getting injured did not significantly change with age (Table 1).

The Proportion of animal injury was 67% among males as compared to (33%) females. The odds of getting injury were 1.8 times more common among males than females. The association between gender & animal injury was statistically significant ($p < 0.01$). (Table 2)

The most common type of animal injury was dog bite 33 (39.2%), followed by snake bite 20 (23.8%) while scorpion bite, bull injury and other type of animal injury were 19 (22.7%), 9 (10.8%) & 3 (3.5%), respectively (Table 3).

Table 1: Distribution of animal injury & age

Age (in yrs) (n=4790)		Proportion of animal injury	Odds ratio (95%CI)	P-value
<14	n= 960	14 (16.7)	0.73 (0.31-1.73)	0.43
15-24	n= 1014	12 (14.2)	0.59 (0.24-1.44)	0.20
25-59	n= 2263	47 (56.0)	1.05 (0.52-2.15)	0.89
>60	n= 553	11 (13.1)	1	
Total		84 (100)		

Figure in parenthesis are percentages.

Table 2: Distribution of gender & animal injury

Gender (n=4790)		Proportion of animal injury	Odds ratio (95%CI)	P-value
Female	n = 2221	28 (33)	1	0.01*
Male	n = 2485	56 (67)	1.8 (1.11-2.90)	
Total		84 (100)		

Figure in parenthesis are percentages, CI-confidence interval, *-statistically significant

Table 3: Distribution of gender & different type of animal injury

Different type of animal injury	Total	Male	Female	p-value
Dog bite	33 (39.2)	24 (42.9)	9 (7.2)	0.01*
Snake bite	20 (23.8)	13 (23.2)	7 (25.0)	0.85
Scorpion bite	19 (22.7)	9 (16.1)	10 (35.7)	0.04*
Bull injury	9 (10.8)	7 (12.5)	2 (7.1)	0.75
Other	3 (3.5)	3 (5.4)	--	--
Total	84 (100)	56 (66.7)	28 (33.3)	

Figure in parenthesis are percentages, *-statistically significant

Table 4: Different community and Hospital based studies

Authors (years)	Present study 2010-12	Dongre AR 2010	Mahalakshymy T 2010	Verma PK 2002	Cardona M <i>et al.</i> 2003-04	Virendra K 2005-06	Tambe M. 2006-07	Gururaj G. 2008
Place	Wardha	Pondicherry		Delhi	Andhra Pradesh	Delhi	Pune	Bangalore
Animal-injury	1.8%	4.1%	5.6%	7.8%	8.5%	0.1%	2.9%	1.0%

Discussion

The higher risk of injury among males as compared to the female's, similar finding reported by the WHO. It may be due to the outgoing nature and risk taking nature of males than females.¹ In the present study, the proportion of animal injuries during the last one year was 1.8%. Similar, the proportion of animal injuries from last one year was 2.9%, 1%, 0.1% & 4.1% reported from Pondicherry, Pune, Bangalore & Delhi, respectively (Table 4).^[5-10]

Most common type of injury was the dog bite (39%), followed by snake bite (24%) similar finding from Bangalore.^[11] The present study again impresses that the economically active population (25-59 yrs) is at higher risk of injuries as they are more exposed to the hazardous environment. Similarly, the highest incidence of animal injuries was seen in 10-44 years of age (72%) by Sudarshan *et al.*^[12]

Strength of this study: Data collection & data entry was done by well qualified & trained staff. Detailed information on animal injury was taken. This study being the first community based survey for animal injuries in the rural area of India.

Limitations: Self-reporting, the occurrence of injury event cannot be verified independently and recall bias due to memory decay of study participants. Short recall period of 1 month, 3 month and 1 year was used to minimize the recall bias and should not affect the quality of results'. Animal injuries are a major public health problem in the rural area of India, Although community prevention methods could be instituted based on the present data, like training given to Accredited Social Health Activist (ASHA), Anganwadi worker (AWW) in First Aid of animal injuries and identify the early dangerous sings for a emergency referral of injured using the available Government transport system like calling to 108. Increase the awareness of community people about the early and complete treatment of animal injuries rather using traditional methods for the cure. It reduces the mortality from rabies and envenomations (poisonings from snake bites).

Conclusion

Human beings are the most susceptible host for different animal species to bites. However, the most common are the dog, snake, scorpion, bull, monkey and pig. We identified dog

bite and snake bites pose major public health problem in productive age group of male population. This warrants for more emphasis on male population while designing intervention program. There is need of community based research on types & impacts of different animal injuries in lower & middle income countries.

Conflicts of interest: No conflict of interest noted.

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