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Epidemiological profile of animal bite cases attending Anti rabies clinic and pre-treatment practices adopted by them following animal bite: A cross-sectional study

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Abstract
Introduction: Rabies is a fatal viral disease of central nervous system caused by Lyssavirus type 1. More than 99% of human cases is transmitted by domestic dogs. Religious diversity, sociocultural practices, myth and belief associated with wound management, lack of accurate data and political will are hindrances for rabies control and prevention.
Aim & objectives: To study epidemiological profile of animal bite cases attending anti rabies clinic attached to Government medical College, Nagpur and pretreatment practices adopted by them following animal bite.
Materials and Methods: The present cross sectional study was conducted at Anti-rabies vaccination (ARV) center of Government Medical College, Nagpur. A total of 2537 animal bite cases were reported at the clinic from 1st January 2014 to 31st December 2014 for post exposure prophylaxis out of which 2120 patients participated in the (response rate of 83.56%). Permission to carry out the study was obtained from the institutional ethical committee. Pre-designed and pre-tested Performa was used to collect data regarding variables including socio-demographic profile (like age, sex etc.); information of anatomical site of bite, reporting time etc. Written informed consent was sought.
Results: Majority of the study subjects were males i.e. 69% of the total cases; children under the age of 10 years (19.4%). 93.7% of cases reported were due to dog bite. Majority i.e. 1548 (73.1%) cases reported to the ARV clinic within 24 hours of bite. On interviewing the patients regarding first aid/ local measures conducted after the bite, more than half i.e. 55.2% of the victims reported that they had not taken any first aid measure for their injuries. Many strange items were reported as wound applicants as well.
Conclusions: Despite being one of the oldest recognized diseases known to man, myths and misconceptions continue to surround Rabies. Although reporting to the clinic after exposure was prompt, local wound treatment revealed very poor management practices that need to be addressed immediately. It is recommended that seriousness of animal bites be reinforced in the minds of people and good wound care taught to all patients and relatives so that awareness of local treatment improves in the population at large.

Keywords: Rabies, Animal bite, Pre-treatment practices, Post-exposure prophylaxis

Introduction

Rabies is a fatal viral disease of central nervous system caused by Lyssavirus type 1. Primarily a zoonotic disease that is almost always fatal following the onset of clinical signs. In more than 99% of human cases, the rabies virus is transmitted by domestic dogs. It affects domestic and wild animals, and is transmitted through bites or scratches, usually via saliva.

It is estimated that 3.3 billion people across 150 countries and territories are at risk of contracting rabies [1]. The annual estimated number of dog bites in India is 17.4 million, leading to estimated 18,000–20,000 cases of human rabies per year [2]. The annual global death toll is around 50,000–60,000, with 99% occurring in tropical developing countries [3]. Around36% of these rabies related deaths occur in India every year [4]; with dog bites being responsible for 97% of these cases [1]. Religious diversity, sociocultural practices, myths and beliefs associated with wound management, lack of accurate data and political will are hindrances for rabies control and prevention. With this background, the present study was carried out with an objective to know epidemiological profile of animal bite cases attending antirabies clinic attached to Government medical College, Nagpur and pretreatment practices adopted by them following animal bite.

Materials and Methods

The present cross sectional study was conducted at Anti-rabies vaccination (ARV) center of Government Medical College, Nagpur. A total of 2537 animal bite caseswere reported at the clinic from 1st January
2014 to 31st December 2014 for post exposure prophylaxis. Out of these, 2120 patients gave their consent to participate in the study and were interviewed, making a response rate of 83.56%. Permission to carry out the study was obtained from the institutional ethical committee.

Pre-designed and pre-tested Performa was used to collect data regarding variables including socio-demographic profile (like age, sex etc.); information of anatomical site of bite, reporting time etc.; as well as information regarding nature of biting animal (including type of animal, ownership of animal whether pet or stray, provocation status etc.) was collected. A bite was consider as provoked, if it resulted from the subject initiating the interaction with the animal such as playing with dog, or annoying the dog during his meal [5]. Data was

collected by means of a personal interview at the time of first visit to the clinic. Written informed consent was sought.
Categorization of exposures was done as per guidelines given by World Health Organization (WHO) and appropriate post-exposure prophylaxis was provided [6]. Data was entered into Microsoft Excel 2013 and analyzed using SPSS version 20. The results were presented in the form of frequencies and percentages and appropriate graphs and tables were made.

Results and Discussion

Animal bite is a major public health problem in India. The distribution of cases enrolled in the study according to age group and gender has been shown n Figure 1. In the present study, males constituted 69% of the total cases. Male preponderance may probably be due to increased mobility and hence increased risk of exposure to animal bite. Similar finding were observed in studies by Khokhar *et al.,* [7], Bedi *et al.,* [8] and Behera *et al.,* [9] where 69.9%, 71.6% and 69.9% of total reported cases were males. In our study, although all age groups were affected, however children under the age of 10 years were the most common victims (19.4%) followed by adolescents (18.4%). Predominant involvement of children and adolescents has also been observed in studies by Vyas *et al.,* [10], Behera *et al.,* [9] and Masoodi *et al.,* [11]. This could probably be attributed to the fact that children and adolescents are more likely to provoke dogs resulting in them getting bitten. Also, it was observed that the incidence of animal bite decreased with increasing age. These findings are comparable with observations of studies conducted by Tiwari *et al.,* [12], Shetty RA *et al.,* [13] and Borkar *et al.,* [5]. Younger children may not realize that their playful actions may cause an angry/defensive reaction from the dog; and older persons are wise enough not to provoke dogs or other animals intentionally.
Table 1 shows the distribution of cases enrolled in the study according to characteristics of the biting animal. In the present study, dogs were found to be the main animal incriminated; responsible for 93.7% of cases reporting to the ARV clinic. This observation is seen uniformly in other studies as well and is also in accordance with National data [1]. 1411 (66.5%) cases of bites of the total were due to stray animals (Dogs, Cats) and 624(29.4%) were due to pet animals; whereas wild animals were responsible for small proportion of cases i.e. 85(4.1%). These findings are quite similar to findings of Behera *et al.,* [9] and Khokhar *et al.,* [7] who also reported that 69.7% and 73.8% of animal bites were due to stray street dogs respectively. WHO in a survey in 2004, noted thatthe dog is mostly responsible for Rabies transmission in India probably because is notan animal of economic importance. Besides, they reported, that dogs are greatly loved, protected by vast majority of people based on not only its compassionate and non-violent nature but more so because of its proven loyalty to its master. There has also been a surge of animal rights activism in the recent past in the country with a vociferous support even from political quarters[14]. All these factors are a major contribution towards dogs being the most populous stray animal in India and hence, the most commonly incriminated biting animal reported to any ARV clinic all over the country. In our study 59.8% bites were unprovoked; which was consistent with the study by Behera *et al.,* [9], Wagh *et al.,* [4] and Khokhar *et al.,* [7] in which they found unprovoked bites in 56.6%, 77.8% and 77.7% cases respectively. A bite was consider as provoked, if it resulted from the subject initiating the interaction with the animal such as playing with dog, or annoying the dog during his meal [5].
It is widely known that rabies once contracted is 100% fatal. The distribution of cases according to characteristics of wound have been shown in table 2. Lower limb was observed to be the major anatomical site of bite in 60.1% of cases, probably as it is most easily approachable. Similar finding were observed in other studies too. More than half of the wounds observed in the present study belonged to Category or Class III (as per WHO guidelines) [2] i.e. 58.3% followed by 26.6% Class II wounds. On interviewing the patients regarding first aid/ local measures conducted after the bite, more than half i.e. 55.2% of the victims reported that they had not taken any first aid measure for their injuries. Among those who had taken first aid measures, 16.2% reported using water, 8.4% used soap and water while 11.2% and 0.8% applied antiseptic ointment over wound and having done dressing from hospital respectively. However, remaining 8.2% of patients had done poor management of wound by applying common household and kitchen items like salt, turmeric etc. Vyas *et al.,* [10] also reported 66.3% patients using local remedies for local wound management and 28% patients surveyed had done no immediate management of the wound. Our clinic has a variety of IEC (Information Education Communication) material regarding wound management on display which we insist the patients and their relatives read. We counsel them regarding do's and dont's of wound care and encourage them to educate their other family members and neighbors as well.
Table 3 depicts distribution of cases according to time lapse between animal bite and attending ARV clinic. The study observed that 1548 (73.1%) cases reported to the ARV clinic within 24 hours of bite, whereas only 6.6% patients visited 4 days after the bite. This indicates that there is a relatively good level of awareness regarding the seriousness of animal bite and its consequences in the study population. This finding is in accordance with the findings of Bharadva *et al.,* [15] who observed that 94.7% patients reported to the clinic within 24 hours of the bite.

Conclusion

Animal bite is a major public health problem in India. In the present study, majority of the study participants were males (69%), children under the age of 10 years (19.4%). Dogs were found to be the main animal incriminated, responsible for 93.7% of cases and 66.5% cases were due to stray animals (Dogs, Cats). The study observed that 1548 (73.1%) cases reported to the ARV clinic within 24 hours of bite indicating relatively good level of awareness regarding the seriousness of animal bite and its consequences in the study population. Lower limb was observed to be the major anatomical site of bite in 60.1% of cases. More than half i.e. 55.2% of the victims reported that they had not taken any first aid measure for their injuries. Despite being one of the oldest recognized diseases known to man, myths and misconceptions continue to surround Rabies. Although reporting to the clinic after exposure was prompt, local wound treatment revealed very poor management practices that need to be addressed immediately. It is recommended that seriousness of animal bites be reinforced in the minds of people and good wound

care taught to all patients and relatives so that awareness of local treatment improves in the population at large.

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