

Research Article

Epidemiology of Animal Bite Cases Attending Casualty at a Tertiary Care Hospital, Ongole

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ABSTRACT

Background: Animal bites, particularly dog bites, are a major public health concern due to the risk of rabies, a zoonotic disease that is almost invariably fatal once symptoms develop. Despite effective post-exposure prophylaxis (PEP), India continues to bear a substantial burden.

Objectives: To assess the epidemiological profile of animal bite cases and preventive measures.

Methods: A hospital-based cross-sectional study was conducted over 3 months (April to June 2024) at a tertiary care hospital in Ongole, Andhra Pradesh. A total of 200 animal bite victims were included using convenience sampling. **Results:** Most of the victims were aged 25-50 years (42.5%), males constituting 68.5%. Dog bites accounted for 94.5% of cases. 79% were due to stray dogs and 90% unprovoked. Category II wounds were most common. Lower limbs were affected in 66.5% of cases. Although 66.5% cleaned wounds before hospital visit. Early reporting (within 6 hours) was observed in 72.5%, while 25.5% used home remedies.

Conclusion: Dog bites remain a significant public health issue. While treatment-seeking behaviour was satisfactory, gaps in appropriate wound care persist, emphasizing the need for improved awareness and strengthened rabies prevention strategies.

Keywords: Animal Bite, Stray Dogs, Anti Rabies Vaccination, Wound Care, Provoked Bite.

INTRODUCTION

Animal bites, particularly dog bites, constitute a major public health problem due to their association with rabies, a zoonotic viral disease that is almost invariably fatal once clinical symptoms develop ^[1,2]. Rabies remains endemic in many parts of the world, with the World Health Organization (WHO) estimating approximately 59,000 human rabies deaths annually, predominantly occurring in low- and middle-income countries of Asia and Africa ^[1]. Globally, dog-mediated rabies accounts for more than 99% of human rabies deaths, underscoring the critical importance of prevention of animal bites and timely post-exposure prophylaxis (PEP) ^[2].

India bears a disproportionately high burden of rabies, contributing nearly one-third of global rabies deaths, despite the availability of effective vaccines and immunoglobulin ^[3]. It is estimated that approximately 17 million animal bite cases occur annually in India, resulting in nearly 20,000 rabies-related deaths, most of which are preventable through appropriate wound care and PEP ^[4]. Dogs remain the principal reservoir and transmitter of rabies in the country, with the Association for Prevention and Control of Rabies in India (APCRI)

multicentric study demonstrating that over 95% of human rabies cases are attributable to dog bites, predominantly from stray and free-roaming dogs ^[5]. Persistent challenges such as inadequate wound washing, inappropriate first-aid practices, delayed health-seeking behaviour, and incomplete vaccination continue to impede rabies prevention efforts ^[6]. Effective rabies control therefore necessitates a One Health approach, integrating human health services, veterinary public health, mass dog vaccination, animal birth control programmes, and community participation ^[7].

Surveillance data from the Integrated Disease Surveillance Programme (IDSP) indicate a consistently high burden of animal bite cases across multiple Indian states, including Andhra Pradesh, with several districts reporting high outpatient and emergency attendance due to dog bites ^[8,9].

However, published hospital-based epidemiological data from tertiary care institutions in the state, particularly from Ongole, remain limited. Generating local evidence is essential to identify gaps in prevention and strengthen rabies control strategies toward achieving India's goal of dog-mediated rabies elimination by 2030 ^[7].

Aim: To assess the epidemiology of animal bites and their preventive measures.

Objectives

1. To identify the socio-demographic factors influencing animal bites.
2. To classify the types of animal bite wounds.
3. To evaluate the preventive measures taken for animal bite wounds.

MATERIALS AND METHODS

A hospital-based cross-sectional study was carried out at the animal bite clinic of a tertiary care hospital over a period of 3 months, from April to June 2024. Convenience sampling was used, and all cases attending the clinic during this period were included, making a total of 200 participants. Individuals who were non-cooperative or severely injured were excluded from the study.

Ethical Approval: The study was approved by the Institutional Ethics Committee of Government Medical College, Ongole, Andhra Pradesh.

(IEC-REG.NO.: ECR/1351/Inst/AP/2020)

Data Collection: A Written informed consent was obtained after the study was explained to patients. A Predesigned, semi-structured questionnaire was used to collect the data of the patients. Questionnaire consists of sociodemographic profile, animal bites & categories, preventive measures. Data was collected through face-to-face interview. Data

was entered in MS Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 20. The results were presented in terms of frequencies and percentages.

Operational Definitions Related To Animal Bite ^[10]:

A. Provoked Bite: Bite resulting from subject initiating interaction with the pet animal such as playing with the dog, annoying the animal during the meal, and pelting stone at the animal.

B. Vaccinated Pet: A pet animal is considered currently vaccinated and immunized if the initial vaccination was administered at least 28 days previously or a booster vaccination has been administered in accordance with recommendations.

C. Classification of Animal bite wounds ^[1]

Category of wound and Type of contact or exposure with suspect rabid animal

- **Category I** - touching or feeding animals, animal licks on intact skin.
- **Category II** - nibbling of uncovered skin, minor scratches or abrasions without bleeding.
- **Category III** - single or multiple transdermal bites or scratches, contamination of mucous membrane or broken skin with saliva from animal licks, exposures due to direct contact with bats.

RESULTS

Table 1: Socio Demographic Profile of Participants (N=200)

Sr. No.	Variable	Category	Frequency (%)
1.	Age (years)	0–14	45 (22.5)
		15-24	40 (20.0)
		25–59	85 (42.5)
		>60	30 (15.0)
2.	Gender	Male	137 (68.5)
		Female	63 (31.5)
3.	Education	Illiterate	60 (30.0)
		Primary	54 (27.0)
		Middle school	33 (16.5)
		High school	14 (7.0)
		Intermediate	18 (9.0)
		Graduate & above	21(10.5)
4.	Occupation	Professional	12(6)
		Semi-professional	10 (5)
		Clerical, shop owner	15 (7.5)
		Skilled	10 (5)
		Semi-skilled	45 (22.5)
		Unskilled	60 (30)
		Unemployed	48 (24)
5.		I: Upper	6 (3.0)
		II: Upper middle	8 (4.0)

	Socio-economic status (Modified B.G.Prasad 2023)	III: Middle	117 (58.5)
		IV: Lower middle	62 (31.0)
		V: Lower	7 (3.5)
6.	Place of Residence	Rural	58 (29.0)
		Urban	142 (71.0)

A total of 200 patients were interviewed for the study after inclusion and exclusion criteria was applied. The majority were males (68.5%), living in urban areas (71.0%), and belonged to

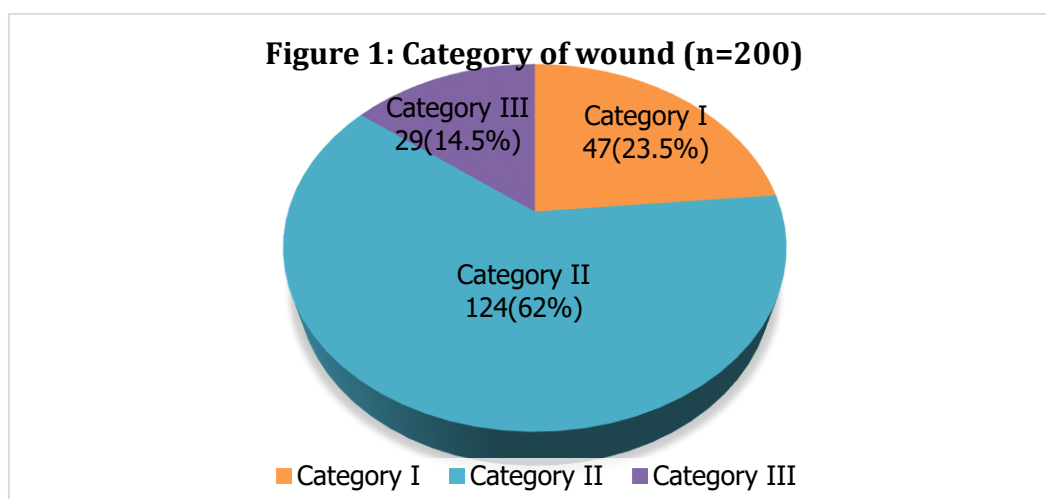
the 25–59 years age group (42.5%). one third were unemployed (30%), unskilled (24%), and belonged to the middle class (58.5%), with 30% being illiterate. [Table 1]

Table 2: Profile of Animal bite (n=200)

S.No.	Variable	Category	Frequency (%)
1.	Type of Animal	Dog	189 (94.5)
		Others (Cat, Rat)	11 (5.5)
2.	Time of Bite	Morning	81 (40.5)
		Afternoon	45 (22.5)
		Evening	35 (17.5)
		Night	39 (19.5)
3.	Site of Bite	Lower limb (LL)	133 (66.5)
		Upper limb (UL)	57 (28.5)
		Head & Neck	6 (3.0)
		Thorax	2 (1.0)
		UL & LL	2 (1.0)
4.	Animal - Adopted / Stray	Adopted	42 (21.0)
		Stray	158 (79.0)
5.	Animal - Provoked / Unprovoked Bite	Provoked	20 (10.0)
		Unprovoked	180 (90.0)
6.	Animal Vaccination Status	Yes	35 (17.5)
		No	23 (11.5)
		Not Known	142 (71.0)

In the present study, dogs were responsible for the majority of animal bite cases (94.5%), whereas other animals such as cat and rat bites were only 5.5% of cases. The majority of the incidents were unprovoked (90.0%) and less than half of the bites (40.5%) occurred during

the morning hours by stray dogs (79%). Nearly two-thirds of the victims (66.5%) sustained injuries to the lower limbs with vaccination status of the biting animal was unknown (71.0%). [Table 2]



Most common were Category II wounds (23.5%), and Category III wounds (14.5%). (62.0%), followed by Category I wounds [Figure 1]

Table 3: Preventive Measures taken for Animal bite wounds (n=200)

S.No.	Variable	Category	Frequency (%)
1.	Wound cleaned before reaching the hospital	Yes	133 (66.5)
		No	67 (33.5)
2.	Method of wound cleaning before reaching the hospital	Soap and water	80 (40.0)
		Water alone	42 (21.0)
		Soap and antiseptic	11 (5.5)
		Not cleaned	67 (33.5)
3.	Duration of wound cleaned before reaching to the hospital (minutes)	< 1 min	57 (42.85)
		1–5 min	71 (53.38)
		>5 min	5 (3.77)
4.	Time interval between bite and hospital presentation (hours)	1–6 hrs	145 (72.5)
		6–12 hrs	4 (2.0)
		12–24 hrs	38 (19.0)
		>48 hrs	13 (6.5)
5.	Use of home remedies	None	149 (74.5)
		Turmeric	35 (17.5)
		Bitter gourd juice	7 (3.5)
		Herbal leaves / Powder	9 (4.5)
6.	Treatment received at the hospital	Immunoglobulins	29 (14.5)
		ARV	153 (76.5)
		TT	33 (16.5)

Among the 200 study participants, before reaching to the animal bite clinic, wound cleaning was performed by 66.5%, while one third (33.5%) did not clean the wound at all. Of all those who cleaned, the most common method used was soap and water (40.0%), followed by water alone (21.0%) and soap with antiseptic (5.5%). Half of them (53.38%) cleaned the wound for 1–5 minutes, followed by less than 1 minute (42.85%), and only 3.77% cleaned for more than 5 minutes.

The majority (72.5%) presented to the hospital within 1–6 hours following the animal bites, 19.0% presented within 12–24 hours, 6.5% after 48 hours, and 2.0% within 6–12 hours. Three fourths (74.5%) did not use any home remedy, while 17.5% of participants used turmeric, 4.5% used herbal leaves or powder, and 3.5% used bitter gourd juice. In the hospital, anti-rabies vaccine (ARV) was given to the majority (76.5%), followed by tetanus toxoid (16.5%) and immunoglobulins (14.5%). [Table 3]

DISCUSSION

The present study demonstrates that animal bites continue to pose a significant public health problem, with dogs accounting for 94.5% of all bite exposures. Similar findings have been

consistently reported across India. Sudarshan *et al.* [11] in their multicentric study reported dog bites contributing to over 95% of cases, while Patil *et al.* [12] and Karthikeyan *et al.* [13] documented proportions ranging from 88% to 92%, reaffirming dogs as the principal source of exposure in the country.

The most affected age group was 25–59 years (42.5%), followed by children aged 0–14 years (22.5%). Similar age distributions were reported by Sharma *et al.* [14] and Singh *et al.* [15], where adults and children together constituted the majority of animal bite cases.

In the present study, 68.5% of bite victims were males, showing a clear male predominance. Comparable observations were reported by Patil *et al.* [12], Sharma *et al.* [14], and Reddy *et al.* [15], who found male predominance ranging from 65% to 72%. This may be attributed to greater outdoor activity, occupational exposure, and increased interaction with stray dogs.

Regarding educational status, 57% of victims were illiterate or had only primary education. Studies by Karthikeyan *et al.* [13] and Chauhan *et al.* [16] reported that lower educational status was associated with poor awareness regarding rabies transmission and appropriate wound care, which may explain the continued use of

inappropriate first-aid practices observed in the present study.

Occupation-wise, unskilled workers (30%) unemployed (24%) and constituted the majority of bite victims. Similar occupational patterns were observed by Reddy *et al.* [15] and Singh *et al.* [17], who reported higher bite incidence among daily wage workers due to increased outdoor exposure and lack of supervision among children.

With respect to socioeconomic status, 58.5% of victims belonged to the middle class, followed by 31% from the lower-middle class. Patil *et al.* [12] and Chauhan *et al.* [16] noted that individuals from lower and middle socioeconomic strata were more likely to be exposed to stray dogs and less likely to practice appropriate wound care.

In terms of place of residence, 71% of bite victims were from urban areas, reflecting the growing challenge of stray dog populations in urban and peri-urban settings. Similar urban predominance was reported by Patil *et al.* [12] and Rajkumari *et al.* [18], highlighting issues related to urbanization, waste management, and inadequate animal birth control measures. The most common site of injury in the present study was the lower limbs (66.5%), followed by the upper limbs (28.5%). Reddy *et al.* [15] and Rajkumari *et al.* [18] reported comparable lower-limb involvement ranging from 60% to 75%, typically associated with unprovoked bites by stray dogs.

In the present study, Category II wounds constituted the majority (62%), followed by Category I (23.5%) and Category III (14.5%) exposures. This distribution is comparable to findings reported by Patil *et al.* [12], Karthikeyan *et al.* [13], and Sharma *et al.* [14], where Category II bites were the most frequent presentation among animal bite victims.

In the present study, 79% of bites were caused by stray dogs, 90% were unprovoked, and the vaccination status of the animal was unknown in 71% of cases, further emphasizing the risk posed by uncontrolled dog populations.

Although 66.5% of participants cleaned the wound before reaching to the hospital, only 40% used soap and water, which is the recommended first-aid measure. Karthikeyan *et al.* [13] and Chauhan *et al.* [16] similarly reported wound-washing practices in 50–65% cases of dog bite victims. The use of home remedies was observed in 25.5% of cases in the present study, comparable to the 20%–35% reported by Patil *et al.* [12] and Chauhan *et al.* [16].

In the present study, only 53.38% washed the wound for 1–5 minutes, indicating inadequate wound care practices. Similar finding was reported by Karthikeyan *et al.* [13], where most patients washed for less than the recommended duration. The World Health Organization recommends thorough washing of bite wounds with soap and running water for at least 15 minutes as a critical step in rabies prevention, which was not adequately practiced in the present study [9].

Encouragingly, 72.5% of victims reported to the hospital within 6 hours, indicating better treatment-seeking behaviour compared to earlier studies that reported delayed presentation in 30%–40% of cases, as noted by Sharma *et al.* [14] and Chauhan *et al.* [16].

In the hospital, as a key preventive measure, 76.5% of bite victims received anti-rabies vaccine (ARV), and immunoglobulins were administered for all Category III wounds (14.5%), reflecting good adherence to standard post-exposure prophylaxis protocols. Similarly high ARV uptake has been reported by Patil *et al.* [12] and Sharma *et al.* [14], indicating improved institutional compliance with rabies prevention guidelines. Ensuring timely and complete administration of ARV along with appropriate tetanus prophylaxis remains central to preventing rabies-related morbidity and mortality.

Strengthening proper wound care practices is essential, with focused health education promoting immediate and thorough washing of bite wounds with soap and running water for at least 15 minutes. Special emphasis is needed for high-risk groups such as unskilled workers, low-literacy urban populations to discourage the use of home remedies.

CONCLUSION

The study found that the majority of animal bites were caused by stray animals predominantly unprovoked dogs affecting the lower limbs in adult males. Although many participants cleaned their wounds and presented early within 1–6 hours and received anti-rabies vaccination, still some did not even clean their wounds before reaching the clinic.

While treatment-seeking behaviour was satisfactory, gaps in proper wound care practices still persist indicating a need for improved awareness with focused health education and stronger rabies prevention strategies.

Limitations: Small sample size may limit the generalizability of the study findings. The use of self-reported data may induce response bias.

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Conflict of Interest: None declared

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