Demographic Study and Management of Dog Bites in Tertiary Hospital in Pune, India

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ABSTRACT

Dog bites constitute a significant public health concern worldwide, leading to injuries, infections, and psychological trauma. This retrospective study analyzes demographic and clinical data from 100 patients who presented with dog bites at Kamala Nehru Hospital in Pune, India, between July 15th, 2024 and August 28th, 2024. The study aimed to identify demographic factors associated with dog bite incidents, assess the severity of bites, and analyze post-treatment complications. Key findings include a bimodal age distribution with peaks among younger and older individuals, a significant proportion of unprovoked attacks, and a notable presence of stray dogs in bite incidents. Furthermore, the study revealed a high prevalence of extremity injuries and a significant proportion of Category II bites, indicating a potential for severe complications. These findings underscore the need for multifaceted interventions, including targeted public health campaigns, improved stray animal management, enhanced community education on responsible pet ownership, and improved access to quality medical care.

Keywords: Dog bite, infection, wound, complications, demographics, treatment, public health, epidemiology

INTRODUCTION

Dog bites pose a substantial public health challenge globally, resulting in a spectrum of injuries ranging from minor lacerations to severe tissue damage and potential complications like infections, rabies, and psychological trauma. In India, with its high population density and the presence of a significant stray dog population, dog bites constitute a significant public health concern. Understanding the epidemiology of dog bites, including the demographics of affected individuals, the circumstances surrounding the incidents, and the associated risk factors for complications, is crucial for developing effective prevention and intervention strategies.

This study aims to investigate the demographic and clinical characteristics of dog bite patients presenting to Kamala Nehru Hospital in Pune, India. By analyzing data on patient demographics, bite characteristics, treatment modalities, and post-treatment outcomes, this research seeks to:

- Describe the demographic characteristics of dog bite patients in Pune, including age, gender, occupation, and socioeconomic status.
- Analyze the frequency and severity of dog bite incidents, including the location of the incident, the part of the body affected, the circumstances leading to the bite (provoked vs. unprovoked), and the

type of dog involved (stray vs. pet, breed if identifiable).

- Identify potential risk factors associated with dog bite incidents, such as living in areas with high stray dog populations, child supervision practices, exposure to stray dogs, and socioeconomic factors.
- Assess the prevalence and nature of post-treatment complications, including infections, rabies, and psychological sequelae.
- Explore the impact of sociodemographic factors on access to and utilization of medical care, including delays in seeking treatment and adherence to treatment regimens.

RESEARCH METHODOLOGY

- **Study Design:**
  This study employed a retrospective cohort design, analyzing medical records of patients treated for dog bites at Kamla Nehru Hospital between July 15th, 2024 and August 28th, 2024.

- **Data Source:**
  Data were extracted from the medical records of patients who presented to Kamla Nehru Hospital with dog bite injuries during the study period.

- **Participants:**
  The study included 100 patients with documented dog bite injuries.

- **Data Collection:**
  Data were collected on the following variables:

1. **Patient Demographics:** Age, gender, occupation, residential address, socioeconomic status (assessed using a modified socioeconomic status scale).
2. **Bite Characteristics:** Date and time of the bite, location of the incident (specific neighborhood within Pune), bite site (e.g., head, face, extremities), WHO bite category (Category I or Category II), circumstances of the bite (provoked vs. unprovoked, specific provocation if applicable), type of dog involved (stray vs. pet, breed if identifiable), and estimated dog size.

3. **Treatment:** First aid measures administered at the scene (washing with soap and water, application of antiseptic), tetanus toxoid administration, antibiotics administered (type and duration), rabies post-exposure prophylaxis (if administered), wound closure techniques (sutures, staples), and hospital stay duration.

4. **Complications:** Development of infection (local or systemic, specified by type), rabies, and psychological sequelae (assessed through brief screening questions for anxiety and fear of dogs).

5. **Socioeconomic Factors:** Access to healthcare (distance to the nearest hospital, transportation challenges), delays in seeking treatment (time interval between the bite incident and arrival at the hospital), adherence to treatment regimens (assessed through medical records and patient interviews), and barriers to accessing care (financial constraints, lack of awareness, cultural beliefs).

Data was collected by trained research assistants using a standardized data collection form. Data entry and analysis were conducted.

RESULT
Age Distribution:
The age distribution of patients revealed a bimodal pattern, with peaks observed in the younger age groups (10-20 years) and older age groups (50-60 years). This suggests that children and the elderly may be particularly vulnerable to dog bite incidents.
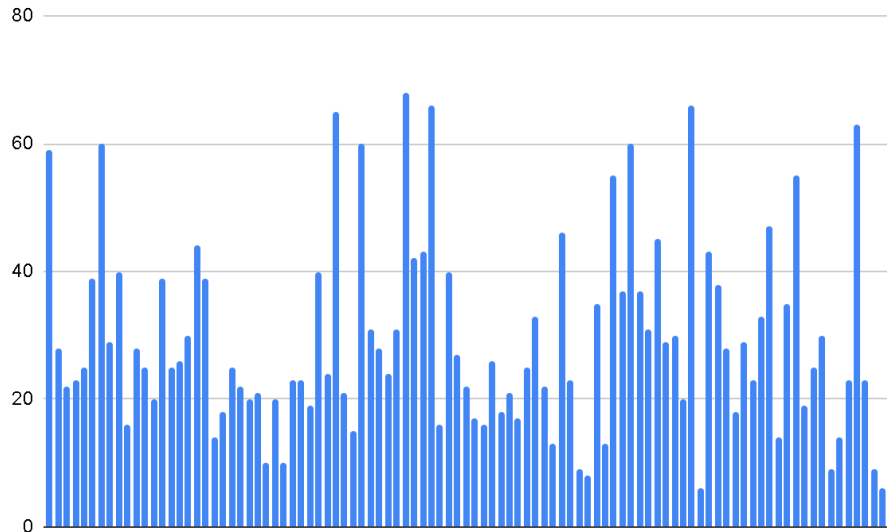
Incident Location:

Dog bite incidents were reported across various areas within Pune. This may indicate areas with higher stray dog populations, increased human-dog interactions, or potential socioeconomic factors influencing the risk of dog bites.
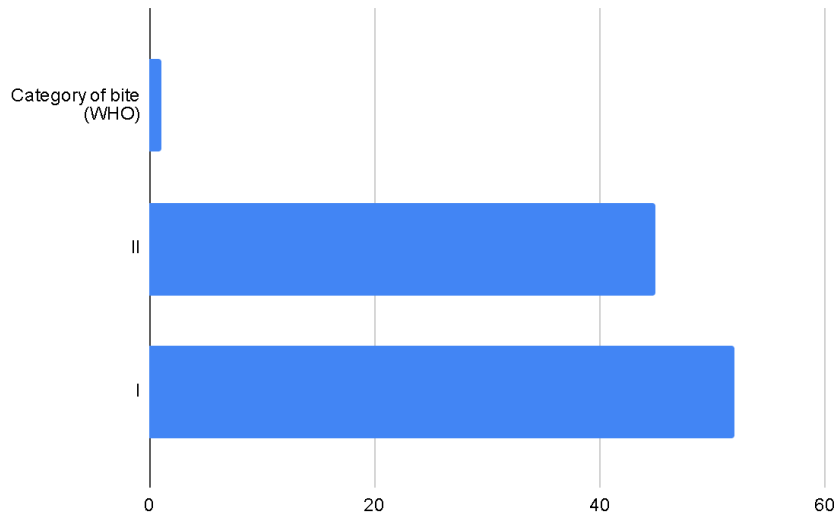
Bite Site:

The most common bite sites were the extremities, particularly the hands, legs, and feet, suggesting that these areas are more vulnerable to dog bites.
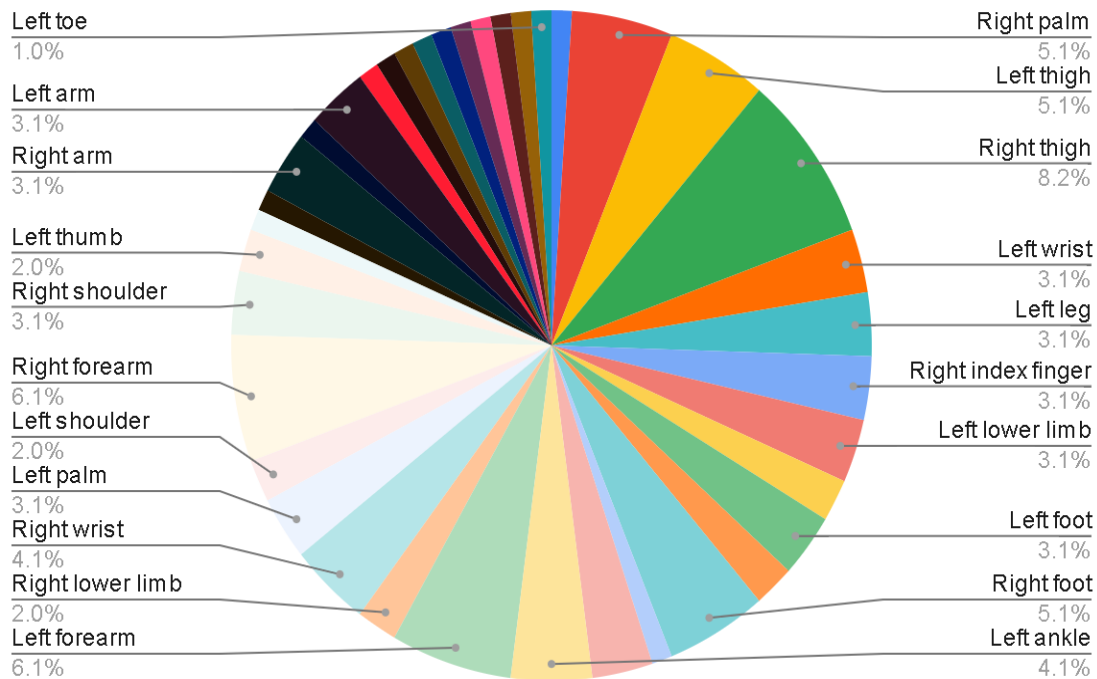
WHO Bite Category:

Category II bites, characterized by deeper tissue damage, highlighting the potential for significant morbidity in a substantial proportion of cases.

Tetanus Toxoid Administration:
The majority of patients 96.9% received tetanus toxoid vaccination. This suggests a high level of awareness among healthcare providers regarding the importance of post-exposure prophylaxis.
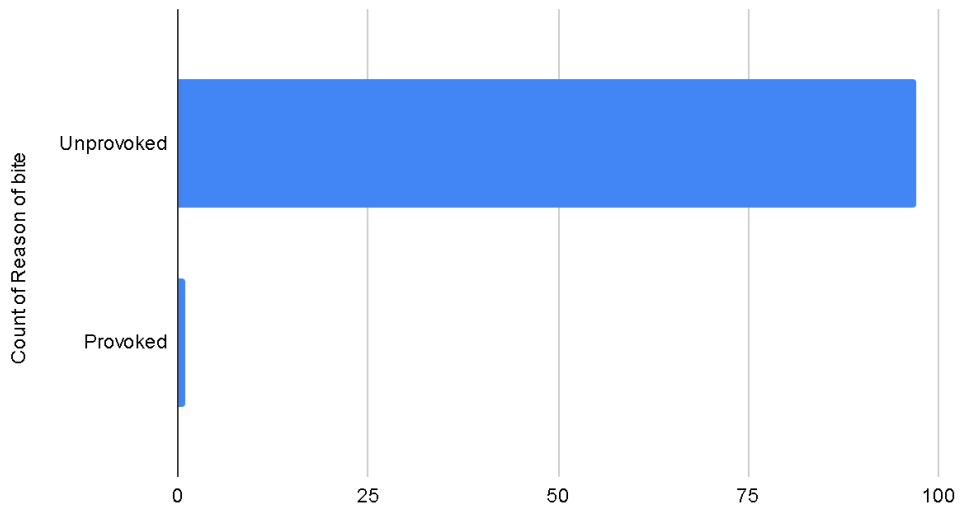
percentage of patients who received TT vaccination

No
3.1%

Yes
96.9%
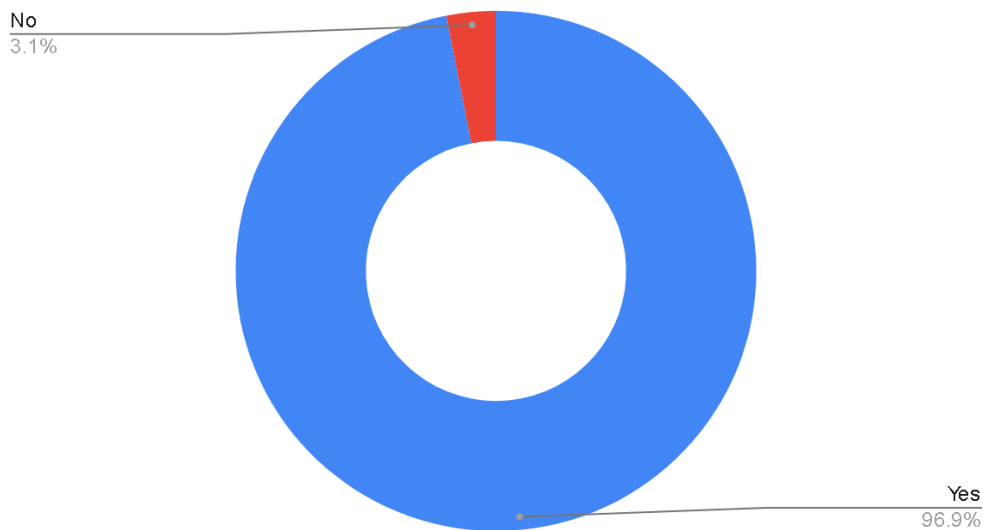
Circumstances of the Bite: Most bites were reported as unprovoked. This finding underscores the need for interventions to address factors contributing to unprovoked attacks, such as stray dog management and public education on responsible dog ownership.
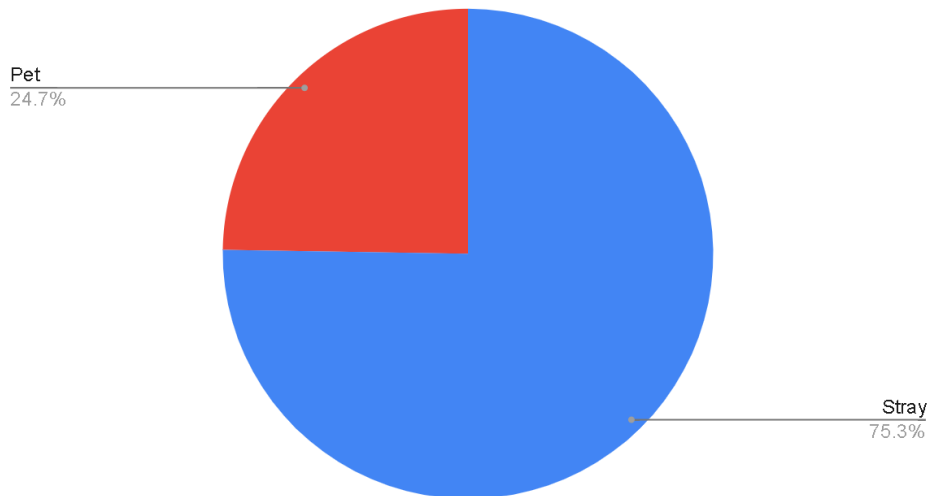
Reason of bite

Type of Dog Involved:

Stray dogs were involved in 75.3% of the bite incidents. This highlights the significant role of stray dog populations in contributing to the burden of dog bites in the region.
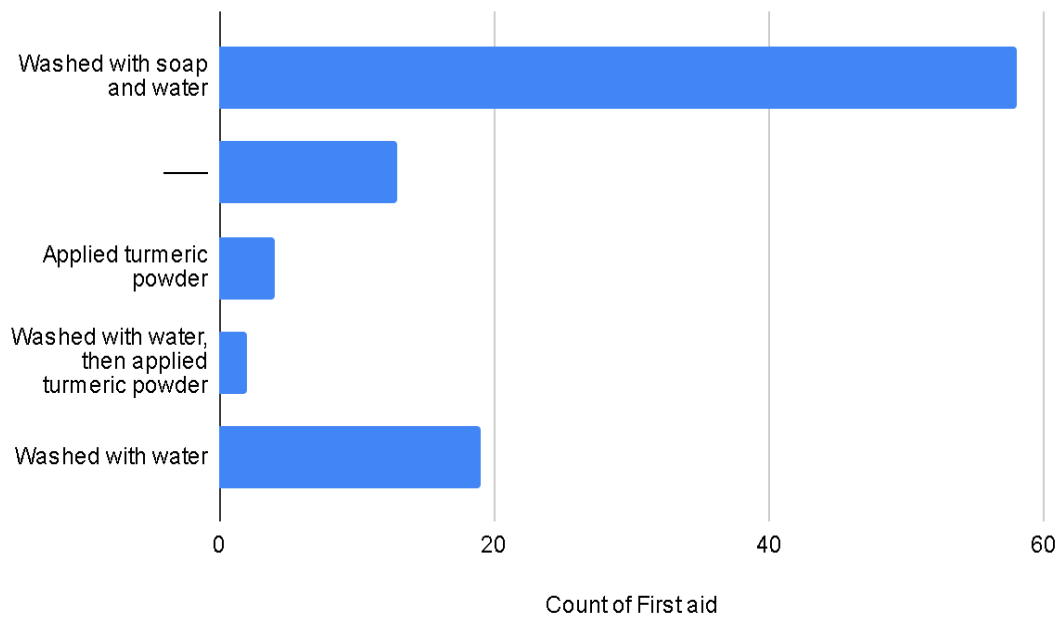
percentage of stray and pet dogs involved

First Aid Measures:

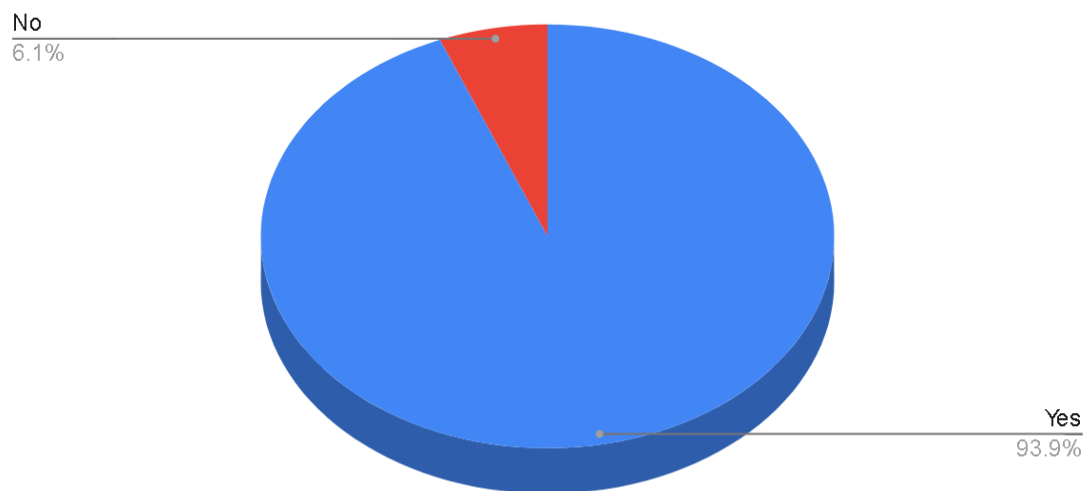The most common first aid measure was washing the wound with soap and water. While this is a crucial first step, further research is needed to evaluate the effectiveness of different first aid measures in preventing infections.
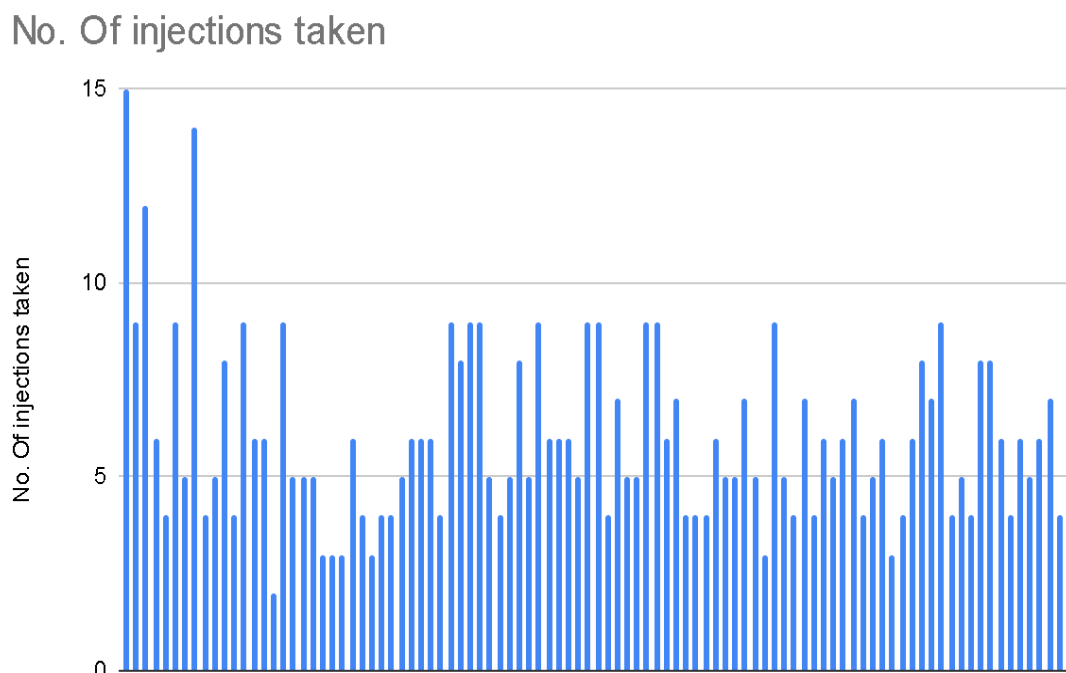
First aid

Adherence to Treatment:

Adherent to the treatment

Most patients 93.9% were adherent to the prescribed treatment.

Number of Injections ARV Received:

No. Of injections taken

DISCUSSION

Our findings indicate that dog bites disproportionately affect younger individuals, with a majority of incidents involving stray dogs. The high prevalence of unprovoked bites underscores the need for effective stray animal control measures and public education campaigns to promote responsible dog ownership. The distribution of bite sites highlights the vulnerability of extremities, suggesting a need for protective measures.

The analysis of WHO bite categories and complications emphasizes the importance of prompt and appropriate medical care. While most patients adhered to treatment, efforts should be made to address potential barriers to adherence and ensure optimal patient outcomes.

LIMITATIONS

This study has several limitations, including the retrospective design and potential for missing data. The limited information on specific treatments and complications restricts the depth of clinical analysis. Further research with a larger sample size and more detailed clinical data is needed to confirm these findings and explore additional risk factors.

CONCLUSION

This study provides valuable insights into the demographics and clinical characteristics of dog bite patients in Pune. The findings highlight the need for targeted public health interventions to reduce the incidence of dog bites and improve patient outcomes. Future research should focus on identifying additional risk factors, evaluating the effectiveness of different prevention strategies, and optimizing treatment protocols.

REFERENCES

1. Morgan, M. "Management of Animal Bite Wounds: An Overview." American Journal of Clinical Dermatology, vol. 6, no. 1, 2005, pp. 39-46.

2. Talan, D.A., et al. "Bacteriologic Analysis of Infected Dog and Cat Bites." New England Journal of Medicine, vol. 340, no. 2, 1999, pp. 85-92.
3. Brook, I. "Microbiology and Management of Human and Animal Bite Wound Infections." Primary Care: Clinics in Office Practice, vol. 30, no. 1, 2003, pp. 25-39.
4. Abrahamian, F.M., & Goldstein, E.J. "Microbiology of Animal Bite Wound Infections." Clinical Microbiology Reviews, vol. 24, no. 2, 2011, pp. 231-246.
5. Garvey, M., & Goralnick, E. "Complications of Animal Bites: A Case Series." Annals of Emergency Medicine, vol. 48, no. 1, 2006, pp. 43-48.

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