

## Original Article



# Epidemiological Aspect of Dog Bite and Response of The Dog Bite Victims Attending Vaccination Centre of Sadar Hospital, Sirajganj

Ahmed Nawsher Alam<sup>1</sup>, Mahmuda Siddiqua<sup>2</sup>, Asma Siddiqua<sup>3</sup>,  
Nasreen Akther<sup>4</sup>, Moushumi Sarker<sup>5</sup>, Sailendra Nath Biswas<sup>6</sup>, Chandra Shekhor Bose<sup>7</sup>.

### Abstract

**Background:** Rabies is a public health problem in Bangladesh, with poorer people and children being mainly affected. **Objectives:** The aim of this study was to investigate the behaviours of dog bite victims following a bite and to assess the knowledge and attitude about rabies among dog bite victims. **Materials and Methods:** A cross-sectional type of descriptive study was designed where individual people who came to the vaccination centre from the month of April 2015 to July 2015 for post-exposure prophylaxis were considered. They were interviewed and followed during subsequent visits until they had received their final dose of vaccination. **Result:** Among the victims, males 60.9% were more common than females 39.1% and most of them were children aged below 20 years 51 %, mostly from rural areas 69.3%, had very little primary 46.1% or no education 24.7%. Victims were bitten mostly at their legs 89.3%. In response to question regarding what happens following dog bite, 49% couldn't say anything, and 46% mentioned hydrophobia. Most of them (87%) know that rabies can be transmitted from dogs to humans; 68.4% had no idea that rabies can be prevented in dogs. Though 82.3% bite victims didn't know that rabies in humans can be prevented before a dog bite, 77.7% knew that rabies can be prevented after a dog bite. Use of soap and water was found lowest 13.1% among those who had education upto primary level and highest 53.9% in graduates. **Conclusion:** This study showed that most victims didn't take any washing measures before visiting to hospital which is one of the most important measures recommended by WHO and it was found mostly who had low education level. It also observed that knowledge gap about rabies among the dog bite victims decreased with increased education level.

**Keywords:** Dog bite, Rabies, Rabies vaccine.

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### Introduction

Dog bites in humans are a public health problem in Bangladesh as in other parts of the world. About 96% of rabies mortality in the WHO South East Asian Region (SEARO) is due to dog bites. Approximately 55,000 people die from rabies each year and about 10 million people take post exposure prophylaxis (PEP) annually.<sup>1</sup> Rabies has been a public health problem for a long time in Bangladesh. It is one of the neglected diseases of the country. Rabies affects mainly poor people and children. A survey by the Disease Control Unit (2007) of the Directorate General of Health Services, Bangladesh showed that more than 2000 human beings die from rabies per year, and post-exposure vaccination is taken by more than 3,00,000 person per year. On the other hand, a good number of people bitten by animals remain untreated. In Bangladesh dog bites are the main cause of rabies

transmission but cats and jackals are also involved.<sup>2</sup> National rabies control program has begun in Bangladesh. The effectiveness of this program relies on people visiting health centres for PEP following a dog bite. Dog bites are a serious public health problem worldwide.<sup>3</sup> In USA 4.5 million dog bites were reported in 2002-2003.<sup>4</sup> Similar numbers of dog bites are also reported in UK<sup>5</sup>, Spain<sup>6</sup>, Switzerland<sup>7</sup>, Australia<sup>8</sup> and India.<sup>9</sup> Like in other countries, dog bites are common in Bangladesh because of a big population of stray dogs. There are various types of misconceptions and false beliefs about dog bites among general people and few initiatives have been taken to increase public awareness about rabies. As a result dog bite victims respond to dog bites in different ways. The aim of this study is to characterize the behaviors of dog bite victims before and following a dog bite as well as to understand the epidemiology of dog bites.

1. Principal Scientific Officer, Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh.

2. Associate Professor, Department of Microbiology, Ibn Sina Medical College, Dhaka, Bangladesh.

3. Assistant Professor, Radiation oncology, National Institute of Cancer Research, Dhaka, Bangladesh.

4. Assistant Professor, Community Medicine, Ibn Sina Medical College, Dhaka, Bangladesh.

5. Assistant Professor, Department of Microbiology, Mugda Medical College, Dhaka, Bangladesh.

6. Assistant Professor, Department of Community, Khwaja Yunus Ali Medical College, Sirajganj, Bangladesh.

7. Associate Professor, Department of Community Medicine, Kumudini Women's Medical College, Tangail, Bangladesh.

**Correspondence:** Dr Ahmed Nawsher Alam, Principal Scientific Officer, Institute of Epidemiology, Disease Control and Research (IEDCR), Mohakhali, Dhaka-1212, Bangladesh. E-mail: [anawsher@yahoo.com](mailto:anawsher@yahoo.com); Cell: 01552309515

### Materials and Methods

A cross-sectional descriptive study was designed which depends of an epidemiological case series. Individual people who come to the participating vaccination center from the month of April to July 2015 for post-exposure prophylaxis were considered. Study area was selected purposively. This study included 215 cases of dog bite victims who attended the vaccination centre in Sadar Hospital, Sirajgonj district for treatment and vaccine. All people coming to the selected vaccination center for dog bite post-exposure vaccination who consented to be interviewed were eligible for enrolment. All consenting adult persons were interviewed by trained data collector. Whereas for children aged less than 15 years, the parents or guardians were interviewed. A structured questionnaire with few open ended questions was used for collecting data. Completed questionnaires were collected and were entered into a computer using an Epi-Info version-7 data base. Descriptive analyses of the questionnaire data were conducted in Epi-Info version -7.

### Result

Among the victims, males 131/215, 60.9% were more common than females 84/215, 39.1% and most of them were children aged below 20 years 51%. Almost all were from Muslim family 94% followed by Hindu 6%. Regarding education it was observed that most dog bite victims had very little or no education. Primary education was seen among 99 46.1% victims and no education amongst 49 24.7% victims. Only 7.4% had Higher Secondary education and 6.1% were graduates. Dog bite victims were mostly from rural areas 149/215, 69.3% rather than urban areas 63/215, 29.3%. The mostly affected parts of the body were the legs about 89. 3% followed by hand 8.37%, trunk 2.79%, and head and neck 1% (table I). One hundred ninety-eight 92.1% persons answered that they know about what happens following dog bite but when they were asked to say the name of the disease 97 49% couldn't say anything, 92 46% mentioned hydrophobia. The level of knowledge about transmission, prevention and cure of rabies in humans as well as in dogs were analyzed. Of the 215 bite victims, most of them 87% know that rabies can be transmitted from dogs to humans. Most of the bite victims had no idea that rabies can be prevented in dogs 68.4%. Though 82.3% bite victims didn't know that rabies in humans can be prevented before a dog bite, 77.7% bite victims knew that rabies can be prevented after a dog bite. (table II) This study found that there was a significant relationship between use of soap and water to wash the dog bite wound with education and sex. Use of soap and water was lowest 13.1% among dog bite victims who had education at primary level and it was highest 53.9% among graduates. People with an education level of secondary school or higher washed the wound with soap and water more frequently than people with low education level. Again use of soap and water was more in male 22.9% than in female 15.5% (table III).

**Table I:** Demographic features of dog bite victims and information about dog bites

Socio-Demographic Variables	Data	Frequency (%)
Sex	Male	131(60.93)
	Female	84 (39.07)
Age Group	>0–15	81 (37.85)
	>15–30	61 (28.50)
	>30–45	34 (15.89)
	>45–60	32 (14.95)
	>60	3 (2.81)
Religion	Islam	202 (93.95)
	Hindu	13 (6.05)
Location	Rural	149 (69.30)
	Urban	63 (29.30)
	Slum	2 (0.93)
	Others	1 (0.47)

**Table II:** Regarding use of soap and water to biting site among different educational qualifications and between sexes

Education	Use of Soap and Water		
	Yes	No	Total
No Education	10 (18.87%)	43 (81.13%)	53(100%)
Primary	13 (13.13%)	86 (86.87%)	99 (100%)
SSC	08 (23.53%)	26 (76.47%)	34 (100%)
HSC	05 (31.25%)	11 (68.75%)	16 (100%)
Graduate	07 (53.85%)	06 (46.15%)	13 (100%)
Total	43 (20.00%)	172 (80.00%)	215 (100%)
Sex	Use of Soap and Water		
Male	30 (22.90%)	101 (77.10%)	131 (100%)
Female	13 (15.48%)	71 (84.52%)	84 (100%)
Total	43 (20.00%)	172 (80.00%)	215 (100%)

**Table III:** Distribution of victims by parts of Body being bitten.

Part s of Body	Frequency (%)
Leg	192 (89.30)
Hand	18 (8.37)
Body and Neck	6 (2.79)
Head	1 (0.47)

**Table IV:** Distribution of victims and guardians by knowledge about rabies and dog bite

Questions regarding knowledge about rabies related to dog and human	Response to questions	Frequency (%)
Can you name what condition or disease happens if a dog bites someone	Can't name any disease	97 (48.98)
	Hydrophobia	92 (46.47)
	Become Mad	4 (2.02)
	Pregnant with puppy	3 (1.52)
	Victim will Die	1 (0.50)
	Victim will have Disease	1 (0.50)
Can rabies be transmitted from Dog to Human?	Yes	187 (86.98)
	No	28 (13.02)
How rabies in Human can be transmitted from Dog?	From dog bite	157 (84.41)
	Don't know	13 (6.99)
	By bite and contact with saliva	6 (3.23)
	Contact with saliva	5 (2.69)
	Vaccination	4 (2.15)
	Hydrophobia	1 (0.54)
Can rabies in Dog be prevented?	Yes	57 (26.51)
	No	11 (5.12)
	Don't know	147 (68.37)
Can rabies in Human be prevented before dog bite?	Yes	32 (14.88)
	No	6 (2.79)
	Don't know	177 (82.33)
How rabies can be prevented before dog bite	Vaccination	32 (100)
	Yes	167 (77.67)
Can rabies in Human be prevented after Dog bite	No	10 (4.65)
	Don't know	38 (17.67)
	Vaccination	155 (92.81)
How rabies in Human be prevented after Dog bite	Treatment	8 (4.79)
	By Injection	2 (1.20)
	By taking medicine	2 (1.20)

## Discussion

This study identified that there was a higher proportion of males than females in the population that came to a center for PEP vaccination following a dog bite. Most of the victims were children of less than 20 years. These findings are very similar to those described in several studies conducted both in developed<sup>10-12</sup> and developing<sup>13-11</sup> countries including previous studies from Bangladesh.<sup>12, 15</sup> Increased dog bite incidence in children is considered to be a behavioural risk because of their extreme curiosity, lack of knowledge and experience about dog behaviour and inability to protect themselves from an attack.<sup>3, 12</sup> This study also found that dog bites were more common in rural areas than urban areas and over 90% of victims were Muslims, which reflects the socio-demographic picture of the Bangladesh population.<sup>13-16</sup>

In this study dog bite wounds were more commonly located on the lower extremities than in other parts of the body. Other studies describe that dog bite wounds are usually found on the head, neck, face and body, which is dissimilar to this study result.<sup>14-18</sup> This difference in wound location can be attributed to the difference in ownership of biting dogs, the geographical area of study and circumstantial environment of bite incidence. In countries where pet dog is a tradition, dog bites were more common by pet dog than by non-pet dogs. The bite victims were known to the dogs and were bitten mainly on the head, neck, face and body. The short stature of children and interaction with pets like kissing, embracing and hugging might be the cause.<sup>21-16</sup> On the other hand this study showed that most people were bitten by stray dogs and most commonly on the lower extremities. There are some studies in developing countries where it was found that stray dogs commonly bit the lower extremities.<sup>9, 18, 19</sup> Rabid dog bites to the upper body and extremities (head, neck, arm, hand) are more dangerous than bites to the lower extremities.<sup>17-22</sup>

Understanding people's level of knowledge about dog bites and the risk of potential zoonotic disease transmission particularly rabies, is important for planning an effective control program, through increasing awareness and education program. In this study, about 86.98% dog bite victims were found to have knowledge that rabies can be transmitted from dogs to humans, which is similar to some other studies where knowledge about rabies transmission found much higher such as Tanzania<sup>18-23</sup> 80% and India<sup>19-24</sup> 98.6%. Knowledge about prevention of rabies in dogs as well as in humans was low in the people included in this study. Most of the answers were "don't know". About 77.67% of the dog bite victims knew that rabies in humans can be prevented after a dog bite. All these findings indicate that both general education and knowledge

about rabies was low among dog bite victims, which could hamper the national rabies control program. Another cause might be due to lack of education such that people may have known about rabies and prevention methods but did not understand the question so "don't know" was the safest answer.

One important measure recommended by WHO is to clean the dog bite wound with soap and water, it is an easy measure that can be done at home immediately in order to remove rabies virus from wound and to reduce the chance of getting rabies from a bite of a rabid dog.<sup>20-25</sup> In this study, we found that only 20% dog bite victims used soap and water to wash the wound, which is much lower than that found in a study done in India<sup>19-24</sup> (31.1%) and Bhutan<sup>22-27</sup> (45%). Use of soap and water increases with increased level of education and among males which indicated that even general education have role on taking effective measures to dog bite wound.

## Conclusion

National rabies control program needs actions to make wider coverage effectively among general population regarding knowledge of rabies particularly on proper prevention. Educational information related to rabies should be incorporated in school curricula so that children are became aware of the dangers of rabies. Health education by health education bureau, researchers, and general practitioners plays an important role in raising awareness about rabies and it should be promoted and strengthened.

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## References

- World Health Organization. Rabies and envenomings: a neglected public health issue: report of a consultative meeting, World Health Organization, Geneva, 10 January 2007. [www.who.int/wer/2007/wer\\_8249-8250](http://www.who.int/wer/2007/wer_8249-8250), Assessed on 9/3/18
- Strategy Plan: Elimination of Rabies in Bangladesh, 2010: Bangladesh Situation. [www.dghs.gov.bd/.../Strategy/2010](http://www.dghs.gov.bd/.../Strategy/2010).
- Overall K, Love M. Dog bites to humans-demography, epidemiology, injury and risk. *JAVMA*. 2001; 218: 1923-1934.
- Gilchrist J, Sacks JJ, White D, Kresnow M. Dog bites: still a problem? *Inj Prev*.2008;14: 296-301.
- Morgan M, Palmer J. Dog bites. *BMJ*. 2007; 334:413-417.
- Rosado B, Garc?a-Belenguer S, Leon M, Palacio J. A comprehensive study of dog bites in Spain, 1995-2004. *Vet J*. 2009; 179: 383-391.
- Horisberger U, Stärk KDC, Rüfenacht J, Pillonel C, Steiger A. The epidemiology of dog bites injuries in Switzerland-characteristics of victims, biting dogs and circumstances. *Anthrozoos*. 2004;17: 320-339.
- Kreisfeld R, Harrison J. Dog-related injuries. Australian Institute for Health and Welfare 2005. Available: <http://www.nisu.flinders.edu.au/pubs/reports/2005/injcat75.php>.
- Sudarshan MK, Mahendra BJ, Madhusudana SN, Narayana DHA, Rahman A, Rao NS. et al. An epidemiological study of animal bites in India: Results of a WHO sponsored national-multi centric rabies survey. *J Commun Dis*. 2006; 38:32-39.
- Sacks JJ, Kresnow M, Houston B. Dog bites: how big a problem? *Inj Prev*. 1996; 2:52-54.
- Georges K, Adesiyun A. An investigation into the prevalence of dog bites to primary school children in Trinidad. *BMC Public Health*. 2008; 8:85.
- Dey AC, Shahidullah M, Hossain MA, Mannan MA, Mitra U.. Human rabies among the paediatric population In Bangladesh. *Mymensingh Med J* 2011; 20:245-251.
- Census 2011, Bangladesh Bureau of Statistics. Dhaka WWW. [BBS.gov.bd](http://BBS.gov.bd) accessed on a/3/2018
- Khokhar A, Meena GS, Mehra M. Profile of dog bites cases attending M.C.D. dispensary at Alipur, Delhi. *Indian J Commun Med*. 2003;28:157-160.
- Pancharoen C, Thisyakorn, Lawtongkum W, Wilde H. Rabies exposures in Thai children. *Wilderness Env Med*. 2001; 12: 239-243.

16. Lang ME, Klassen T. Dog bites in Canadian children: a five-year review of severity and emergency department management. *C J Emerg Med.* 2005; 7:309-314.
17. Cleaveland S, Fe'vere EM, Kaare M, Coleman PG. Estimating human rabies mortality in the United Republic of Tanzania from dog bite injuries. *Bull World Health Organ.* 2002; 80:304-310.
18. Sambo, MB. Epidemiological dynamics of rabies in Tanzania and its impacts on local communities. MSc (R) thesis, 2012. University of Glasgow <http://theses.gla.ac.uk/3663>.
19. Ichhpujani RL, Chhabra M, Mittal V, Bhattacharya D, Singh J, Lal S. Knowledge, attitude and practices about animal bites and rabies in general community-a multi-centric study. *J Commun Dis.* 2006; 38:355-361.
20. World Health Organization. Rabies vaccines: WHO position paper. *Wkly epidemiol rec.* 2010; 85:309-320.
21. World Health Organization. WHO recommendations on rabies post-exposure treatment and the correct technique of intradermal immunization against rabies. 1996. WHO/EMC/ZOO/966.
22. Dhand NK, Gyeltshen T, Firestone S, Zangmo C, Dema C, Gyeltshen R, Ward MP.. Dog Bites in Humans and Estimating Human Rabies Mortality in Rabies Endemic Areas of Bhutan. *PLoS Negl Trop Dis.* 2011 November; 29 5(11): e1391.