

Original Research Article

Open garbage dumps and knowledge of rabies among sanitary workers

Ali Jafar Abedi, Samreen Khan*, Saira Mehnaz, M. Athar Ansari

Department of Community Medicine, J.N. Medical College, Aligarh Muslim University, Uttar Pradesh, India

Received: 18 March 2017

Accepted: 04 April 2017

***Correspondence:**

Dr. Samreen Khan,

E-mail: drsamreen2k4@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Rabies is a potentially fatal disease with significant public health importance. Awareness among sanitation workers is a key component for prevention, and needs to be addressed. Therefore, a study was conducted with the objectives to determine the awareness of rabies and role of open garbage dumps in the spread of rabies among sanitary workers.

Methods: A cross sectional study was conducted from January to February, 2017. All of the 65 sanitation workers employed by the University Health Office, Aligarh Muslim University, Aligarh were included in the study after taking their verbal consent. A total of 26 Open Garbage Dumps were studied and classified. The knowledge of rabies was assessed by evolving a scoring system. The data were then analyzed using SPSS statistical software version 24.0.

Results: The mean age of the study population is 32.93 years (mean 38 years, SD 9.74). 62 (95.4%) were males. Mean duration of work was 8.14 years (SD 7.45). Maximum number of study participants had received education upto high school and belonged to social class II. Mean knowledge score paired with different socio-demographic variables show a highly significant association with age, sex, duration of work, education, religion, socio-economic status and whether they owned a pet or not.

Conclusions: Our study revealed that knowledge regarding OGDs and their role in the spread of rabies is poor. OGDs near residential houses and stray dogs increase the risk factors for canine rabies. Therefore, sustained efforts to decrease the stray dog population in residential areas should be advocated.

Keywords: Rabies, Open garbage dumps, Sanitary workers, Knowledge

INTRODUCTION

In developing countries, rabies continues to kill up to 70,000 people annually.¹ It is a zoonotic disease, probably one of the oldest known to mankind, caused by Lyssavirus infection, transmitted to animals or human through bite by rabid animals and is characterized by progressive acute encephalitis that is often fatal.²⁻⁴ Rabies is primarily a disease of terrestrial and airborne mammals, including dogs, wolves, foxes, coyotes, jackals, cats, bobcats, lions, mongooses, skunks, badgers, bats, monkeys and humans. The dog has been, and still is, the main reservoir of rabies in India.⁵⁻⁶

Open garbage dumps (OGDs) are a public health problem in the community and lead to stray dog proliferation. Most wastes had a household origin and stray dogs are mostly attracted by fermentable wastes from cooking or lapsed foods.⁷

Although rabies in domestic and wild animals represents a significant threat to public health and can cause economic losses among livestock, there are very few studies that examine the relation of increasing garbage dumps, stray dog population and perception of sanitary workers regarding their role in the causation and spread of Rabies.³⁻⁵ The workers knowledge, as well as attitudes and perception on rabies, is therefore important for both

prevention of human deaths and control in animals. Therefore, we designed a study to determine the awareness of rabies among sanitary workers and role of Open garbage dumps in the spread of rabies.

METHODS

A cross sectional study was conducted from January to February, 2017.

Study participants and setting

The study was conducted among sanitary workers employed under University Health Office. The University Health Office (UHO) looks after the sanitation and vector control of the university and for this the office has sanitary workers, sanitary jamadars and sanitary inspectors. The work is supervised by the health officer. All the sanitary workers under UHO, were included in the study and were interviewed after taking their verbal consent. The assessment of Open garbage dumps was done by investigators and was categorized on the basis of solid wastes and was characterized as fermentable, hazardous, or non-hazardous wastes.

Study tool

A pre-tested, semi-structured questionnaire was used for interviewing the study participants. The questionnaire was translated to local Hindi language and it was pre-tested in 10 participants, and modified. Apart from the socio-demographic information, the questionnaire had 15 questions related to assessment of perception and knowledge of rabies and its spread via open garbage dumps. The knowledge of rabies was assessed by evolving a scoring system. Each correct answer was given a score of 1, maximum and minimum scores being 15 and 0. The total score was calculated and mean value was reported.

Ethical considerations

Participation was strictly voluntary and was dependent on oral consent by the participants. Respondents were informed of the study and the confidentiality of the data to be collected.

Data analysis

The data was analyzed using Microsoft Excel and SPSS statistical software version 24.0. The value of $p < 0.05$ was considered as statistically significant.

RESULTS

Socio-demographic profile of the study participants

As shown in Table 1, the mean age of the study population was 32.93 (S.D.: 9.74), most of them were males, belonging to Hindu religion and completed at least

high school level of education. Majority of them belonged to Class II Social Class according to Modified B. G. Prasad Classification. 15 (23.07%) possessed a pet animal, majorly a dog (12 (18.4%)). None of them had received a prior training on Rabies.

Table 1: Socio-demographic profile of the study participants.

Study Variable	Number (N)	Frequency (%)
Age		
<30	30	46.2
30-40	19	29.2
>40	16	24.6
Sex		
Male	62	95.4
Female	3	4.6
Duration of work		
<1 year	7	10.8
1-10 years	42	64.6
>10 years	16	24.6
Education		
High School	47	72.3
Intermediate	17	26.2
Graduate and above	1	0.5
Religion		
Hindu	55	84.6
Muslim	8	12.3
Christian	1	1.5
Others	1	1.5
Socio-economic Class		
I	10	15.4
II	32	49.2
III	19	29.2
IV	3	4.6
V	1	1.5
Own a pet		
Yes	15	23.07
No	50	76.9
Pet animal owned		
Cat	8	12.3
Dog	12	18.4
Both	10	15.3
Others	5	7.6
None	50	76.9

*the results (frequencies) are non-cumulative.

Characteristics of open garbage dumps

There were 26 open garbage dumps that were examined by the sanitary workers in the university campus. Majority of the OGDs had plant based waste items (100 (100.0%)), Wood/ paper/ paperboard/ textiles (100 (100.0%)), food (25 (96.15%)) and Rubber/ Plastic waste (21 (80.7%)). None of the examined OGDs had dead wastes/ remains of dead animals.

Knowledge of rabies

The mean knowledge score of the respondents was 5.22 [S.D.: 4.11, maximum: 15, minimum: 0]. 67.7% of the respondents had heard about the disease rabies, but only half of them knew about whom the disease affects (Table 3). Regarding the clinical features of rabies in the human beings, fever, wound infection, hydrophobia and diarrhea was reported by 8 (12.3%), 19 (29.2%), 10 (15.3%) and 7 (10.7%) of the respondents respectively. In animals, the clinical features as reported by the study participants were irritability/ aggression, skin lesions, salivation and loss of fur were reported by 22 (33.8%), 9 (13.8%), 12 (18.4%) and 7 (10.7%) people respectively. Regarding the type of dog involved, the responses were domestic dogs (8, 12.3%), stray dogs (11, 29.2%), wild dogs (5, 7.7%). To control the dog population responsible for the spread of Rabies, 18 (27.6%) of the study population said that dogs should be killed and 17 (26.15%) of them said they need vaccination (Figure 1).

Table 2: Characteristics of Open garbage Dumps (total number surveyed: 26).

Type of waste	Number (N)	Frequency (%)
Fermentable wastes		
Food items	25	96.15
Plant products	26	100.0
Animal waste	11	42.3
Dead animals	0	0.0
Non-fermentable non-hazardous wastes		
Wood/ paper/ paperboard/ textiles	26	100.0
Bricks/ gravel/ tiles	17	65.3
Scrap material (ferrous/non-ferrous)	19	73.0
Hazardous waste		
Glass	8	30.7
Rubber/Plastic waste	21	80.7
Batteries/ electronic and electrical waste	7	26.9

*the results (frequencies) are non-cumulative.

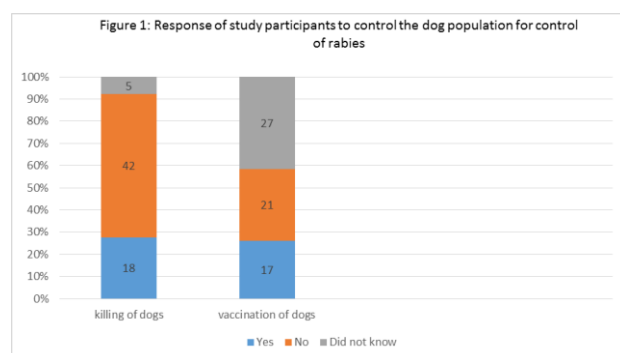


Figure 1: Stacked chart graph showing the response of study participants to control the stray dog population for control of rabies.

Table 3: Knowledge of rabies.

Questions asked to check the knowledge of rabies	Number (N)	Frequency (%)
Ever heard of the disease Rabies		
Yes	44	67.7
No	21	32.3
Who all does this disease affect?		
Humans	18	27.7
Animals	11	16.9
Both	3	4.6
Did not know	33	50.8
What is the source of infection?		
Virus	6	9.2
Bacteria	2	3.1
Dogs	12	18.5
Did not know	45	69.2
What type of dogs are usually involved?		
Domestic	8	12.3
Stray dogs	11	29.2
Wild	5	7.7
Did not know	41	63.1
Other animals (other than dogs) act as source of infection?		
Monkeys	16	24.6
Cats,	3	4.6
Bats,	1	1.5
Other/ none/ did not know	45	69.2
Mode of spread?		
Animal Bite	18	27.6
Licking	4	6.15
Scratches	2	3.07
Touching the animal	2	3.07
Other/ did not know	39	60.0

As seen in Table 4, the mean knowledge score paired with different socio-demographic variables show a highly significant association with age, sex, duration of work, education, religion, socio-economic status and whether they owned a pet or not. Increasing age, male sex, longer duration of work, lower socio-economic status and owning a pet were associated with better knowledge of Rabies.

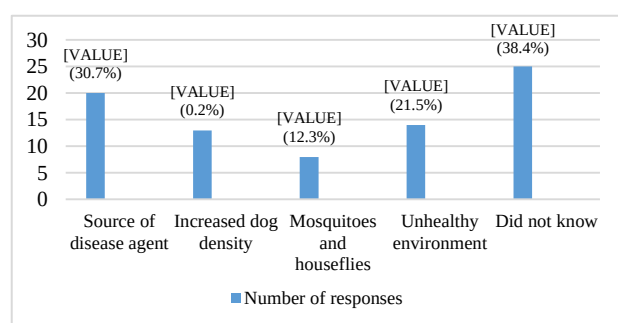


Figure 2: Bar graph showing knowledge of study participants regarding risk factors present in Open garbage Dumps.

Open garbage dumps were recognized as a potential nidus of risk factors for Rabies by 41 (63.07%) respondents. As seen in figure 2, according to maximum number i.e. 20 (30.7%) of these persons, OGDs act as a

source of disease agent. While others said it was due to lead to increased dog density (13 (0.2%)), mosquitoes and houseflies (8, (12.3%)) and unhealthy environment (14, (21.5%)).

Table 4: Table showing association of knowledge score with socio-demographic parameters (Paired T-test).

Socio-demographic study variable	Mean knowledge score	Standard Deviation	95% C.I. (Upper Limit- Lower Limit)	t	p
Age	2.77	10.82	25.04 to 30.40	20.64	0.000
Sex	-4.16	4.11	-5.19 to -3.14	-8.17	0.000
Duration of work	2.92	7.84	0.98 to 4.86	3.01	0.004
Education	-2.27	4.15	-3.30 to -1.24	-4.42	0.000
Religion	-4.01	4.03	-5.01 to -3.02	-8.03	0.000
Socio-economic status	-2.93	4.06	-3.94 to -1.93	-5.83	0.000
Own a pet	-3.36	4.08	-4.38 to -2.35	-6.65	0.000

DISCUSSION

Rabies is an important public health concern with 100% case fatality.⁷⁻⁸ Many of the South Asian countries are endemic to it. Although our study area does not come in the endemic zone, we found out that the knowledge among the municipal workers was poor. This is in contradiction to the data obtained in some endemic countries of South Asia that revealed a high level of knowledge on rabies transmission.⁸⁻¹¹ The present study revealed that 39 (39.0%) respondents did not have any knowledge regarding mode of transmission. In a study by Serebe and Tadesse, 46.8% and 45% respondents respectively answered correctly regarding transmission.^{12,13} In order to prevent the transmission of rabies in a dog population, it is theoretically necessary to vaccinate a minimum of 60 to 70% of the dogs.^{14,15} Our study showed that nearly one fourth of the respondents agreed to vaccination of stray dogs. Our study revealed that less than 50% of the respondents knew about symptoms of Rabies in humans and animals. Similar findings were reported by Muriuki et al where more than half of the respondents in his study were not aware of any presenting feature of a rabid animal.¹⁶ This lack of knowledge of identifying features in the sanitary workers definitely poses risk of human exposure as owners may try to help their sick animals.¹⁶ Moreover, the current results indicate that the study participants believe that Open garbage dumps are a public health problem in the community and lead to stray dog proliferation. Most wastes had a household origin with food and plant items and stray dogs were mostly attracted by fermentable wastes from cooking or lapsed foods. This corroborates previous studies conducted in Cameroon and India.^{15,17} The association of better knowledge of Rabies with sex, education level and pet ownership is in accordance with the findings of Ali et al and Matibag et al.^{6,9}

CONCLUSION

This study reveals that the knowledge that OGDs near residential houses and stray dogs increase the risk factor for canine rabies transmission is poor among the

sanitation workers. Therefore, activities for increasing awareness especially among the risk groups and dog handlers are important in control of Rabies. An integrated control method including environmental cleaning up through the improvement of solid waste management to avoid the proliferation of OGDs is therefore necessary. Furthermore, community-driven activities based on sociocultural conditioning and community capacity at all levels, such as public awareness activities, vaccination, dog registration, dog population management, and rapid response to dog bites, are required. The recently launched program by Government of India in 2016 in the 12th five year plan, also needs recognition or acknowledgement from governments, especially local government as well as regular mentoring to improve and sustain community participation.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380(9859):2095–128.
- Vigilato MAN, Clavijo A, Knobl T, Silva HMT, Cosivi O, Schneider MC, et al. Progress towards eliminating canine rabies: policies and perspectives from Latin America and the Caribbean. *Philos Trans R Soc B Biol Sci*. 2013;368(1623):20120143.
- Kipanyula MJ. Why has canine rabies remained endemic in the Kilosa district of Tanzania? Lessons learnt and the way forward. *Infect Dis Poverty*. 2015;4(1):52.
- Madrasto de Ramos ME, Bravo LC. Knowledge Attitude and Practise of the Community Regarding Animal Bite and Rabies. *PIDSP J*. 2004;8:24–32.

5. Dietzschold B, Li J, Faber M, Schnell M. Concepts in the pathogenesis of rabies. *Future Virol.* 2008;3(3):481–90.
6. Ali A, Ahmed EY, Sifer D. A Study on Knowledge, Attitude and Practice of rabies among residents in Addis Ababa, Ethiopia. *Ethiop Vet J.* 2013;17(2):19-35.
7. Ameh VO, Dzikwi AA, Umoh JU. Assessment of Knowledge, Attitude and Practice of Dog Owners to Canine Rabies in Wukari Metropolis, Taraba State Nigeria. *Glob J Health Sci.* 2014;6(5):226–40.
8. Digafe RT, Kiflew LG, Mechesso AF. Knowledge, attitudes and practices towards rabies: questionnaire survey in rural household heads of Gondar Zuria District, Ethiopia. *BMC Res Notes.* 2015;8:400.
9. Matibag GC, Ditangco RA, Kamigaki T, Wijewardana TG, Kumarasiri PVR, Kalupahana AW, et al. Community-based evaluation of health-seeking behaviour of people with animal bite injuries in a district of Sri Lanka. *J Int Health.* 2008;23:173–9.
10. Sharma M. Knowledge and attitude of dog owner's towards the dog anti-rabies vaccination. *J Nepal Health Res Counc.* 2005;3:11–16.
11. Singh US, Choudhary SK. Knowledge, attitude, behavior and practice study on dog-bites and its management in the context of prevention of rabies in a rural community of Gujarat. *Indian J Comm Med.* 2005;30:81–3.
12. Serebe SG, Tadesse KA, Yizengaw HA. Study on community knowledge, attitude and practice of rabies in and nearby Gondar town, North West Ethiopia. *J Public Heal Epidemiol.* 2014;6(12):429–35.
13. Tadesse G, Anmaw S, Mersha C, Basazinew B, Tewodros F. Assessment of Knowledge, Attitude and Practices about Rabies and associated factors: In a case of Bahir Dar Town. *Global Veterinaria* 2014;13(3):348-54.
14. Meltzer MI, Rupprecht CE. A review of the economics of the prevention and control of rabies. Part 2: Rabies in dogs, livestock and wildlife. *Pharmacoeconomics.* 1998;14(5):481–98.
15. Raymond TN, Roland ME, Françoise KMM, Francis Z, Livo EF, Clovis STH. Do open garbage dumps play a role in canine rabies transmission in Biyem-Assi health district in Cameroon? *Infect Ecol Epidemiol.* 2015;5:26055.
16. Muriuki BJ. Knowledge, Attitude and Practices on Rabies in Kisumu and Siaya Counties, Kenya. University of Nairobi. 2016: 52-5.
17. Puri A, Kumar M, Johal E. Solid-waste management in Jalandhar city and its impact on community health. *Indian J Occup Environ Med.* 2008;12:76-81.

Cite this article as: Abedi AJ, Khan S, Mehnaz S, Ansari MA. Open garbage dumps and knowledge of rabies among sanitary workers. *Int J Community Med Public Health* 2017;4:1722-6.