



Original Research Article

Effectiveness of Health Education on Knowledge Regarding Rabies among Health Workers of West Bengal

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ABSTRACT

Background: Rabies is an exceptionally fatal zoonotic disease and it still remains a public health problem in India. As field level health workers are first line of contact with the general population especially in the rural areas it is highly desirable that they should have the correct knowledge regarding this disease devoid of any myths and misconceptions. This study aims in assessing the improvement of the existing knowledge of rabies following an educational intervention on the various issues of rabies among health workers working with non-government organization.

Methodology: The present study was conducted among 92 field health workers working in two districts of West Bengal (in different NGOS) and were congregated under one roof by West Bengal Voluntary Health Association, Kolkata for imparting training to them on various issues of health like prevention of rabies.

Results: Pre Intervention average knowledge score among participants was 18.22 (± 5.851) which was significantly affected by educational level and experience of participants. Improvement of average total knowledge score after educational intervention was 16.17 ($P < 0.001$). There was also significant increase regarding proportion of participants giving correct response in case of all the 20 knowledge questions covering rabies agent, modes of transmission, different category of bite and their management and dose schedule and route of administration of rabies vaccine ($P < 0.001$).

Conclusion: There was significant improvement of knowledge status in all domains following educational intervention which indicate the need of continuing medical education on regular basis for field health workers.

Key Words: Rabies, Exposure, Prophylaxis, Vaccine

INTRODUCTION

Rabies is an exceptionally fatal encephalitis with almost 100% mortality. It is caused by Rhabdo viruses in the Lyssa virus genus. Transmission typically occurs when broken skin is contaminated with

saliva from an infected mammal usually in association with a bite but in rare instances by scratches.

In spite of rapid and significant improvements across different public health domains rabies continues to be a major

public health challenge in most of the developing countries.

According to World Health Organization (WHO) estimates rabies is prevalent in more than 150 countries and territories and around 55,000 people die of the infection every year, ⁽¹⁾ with India alone accounting for about 20,000 deaths. ⁽²⁾ Majority of the cases of rabies (about 97%) are due to bites from rabid dogs, followed by bites from other animals like the cat, monkey, horse, pigs, and camels. It is well established that immediate post exposure prophylaxis (PEP) measures of wound cleaning and anti-rabies immunization prevent the onset of rabies and death.

Various studies in different parts of the world show that knowledge regarding rabies, its modes of transmission and preventive measures is inadequate among health personnel at all levels like field health workers, nursing students, medical students, nursing staffs and even among doctors. In a study from China, of the 711 people who died of rabies, 6.3% were classified as category one, which should have had no risk for rabies, pointing to the fact that knowledge regarding PEP among healthcare staff was not adequate. ⁽³⁾ In a study on dog bite management among medical officers at six dog bite management centres in Pakistan, the researchers expressed a dire need for improved awareness and understanding of dog bite management among health care providers in order to prevent rabies deaths. ⁽⁴⁾ Studies from third world countries like Tanzania and Turkey have shown a low level of knowledge among physicians regarding zoonotic diseases in general, ⁽⁵⁾ and rabies in particular. ⁽⁶⁾

In this regard correct knowledge among health care providers regarding cause and mode of transmission of rabies, classification of contact with rabid animals and their management and dose schedule of

rabies vaccine is very important. Health care providers particularly the field health workers play a key role in the immediate management of persons with animal bites, thereby preventing rabies cases. For the general mass they are the first level of contact with health care system and they are also most acceptable and accessible to the public. All this makes it more pertinent that they should have adequate and absolute correct knowledge regarding prevention of rabies. Review of literature shows that there is dearth of studies which reveals the knowledge status of health workers regarding rabies or the impact of their knowledge status following a training programme on rabies.

With this backdrop the present study was planned and implemented to assess the existing level of awareness and knowledge regarding the transmission and preventive measures of rabies and the impact of educational intervention measures on the same among field health workers working with different NGOS from 2 districts of West Bengal.

Objectives

1. To assess the knowledge regarding the different aspects of rabies.
2. To determine association of knowledge status with age, sex, educational level and experience.
3. To provide adequate, appropriate and high quality intervention according to deficiency of knowledge of health workers.
4. To assess impact of intervention on knowledge status.

MATERIALS AND METHODS

Study settings:

The study was conducted at West Bengal Voluntary Health Association (WBVHA). The WBVHA is a NGO which conducts the training of health workers operating in the adjoining districts of

Kolkata. We took the responsibility of providing high quality training on Rabies and its preventive measures to grass root level non government health workers hailing from 2 districts of West Bengal (North 24 Parganas and South 24 Parganas). Total number of participants was 92.

Study tools:

1. A **pre-designed pre-tested questionnaire** in local language was used for assessing pre and post intervention knowledge level among health workers regarding rabies and its prevention. The questionnaire was divided into two sections:

Section A contained queries regarding socio-demographic characteristics and other relevant information of the study population

- Age
- Educational qualification
- Years of service
- Previous experience of managing dog bite case
- Previous experience of seeing rabies case

Section B contained knowledge questionnaire which was again subdivided into three parts.

Part 1: 4 items on rabies agent and mode of transmission.

Part 2: 7 items regarding different categories of bite and their management and under.

Part 3: 9 items on dose schedule and route of administration of rabies vaccine.

So there were total 20 items. Two marks were allotted for each correct answer. Zero mark was given for wrong answer or no answer.

2. Slides, printouts and other study materials for CME session arranged for health workers for filling up of their gaps regarding knowledge on rabies and its prevention.

Face validation and content validation of the questionnaire and adequacy and appropriateness of the teaching contents were confirmed and cross checked by the experts of the Dept. of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, Kolkata.

Method of data collection:

Before starting the study permission was obtained from the WBVHA authority.

Activities on Day 1

- All participants were explained about the purpose of the study and that the knowledge that they would acquire would benefit the community they serve. They were also assured that all data provided by the participants would be kept confidential. After getting their approval regarding participation in this study the informed consent was collected from all participants.
- The schedule was used to collect the baseline data regarding
 - ✓ The socio demographic characteristics and experience of the participants
 - ✓ Their knowledge regarding rabies and its prevention
- Educational intervention programme was conducted amongst the health workers through audio visual aid and lecture focussed on the different aspects of rabies. All efforts were made to make the education session ample, adequate and appropriate and at the same time concise and clear. It was specifically designed to impart a comprehensive knowledge, on all aspects of rabies with special emphasis on its prevention. The participants were apparently very active listeners. This was followed by an interactive session which turned out to be very interesting and

participatory. It was ensured that the queries of all the participants were clarified and as a result the involvement of the study subjects was full of enthusiasm and fervour.

Activities on Day 2

- The post intervention assessment was conducted after 2 weeks amongst the study participants using the same questionnaire used for pre intervention assessment of knowledge. It was felt that the post intervention assessment immediately

after the education session would not reflect the true impact of intervention because it would involve only the recent memory of the participants and that a gap of minimum period of two weeks is necessary to accurately assess the effect of intervention and also the amount of retention and the sustenance of the knowledge acquired following the health education session on Rabies and its prevention

Scoring Pattern of Questionnaire

Part of questionnaire	Total No of questions	Score for each correct answer	Score for each wrong or no answer	Maximum attainable score	Minimum attainable score
Part 1: Rabies agent and mode of transmission	4	2	0	8	0
Part 2: Different category of bite and their management	7	2	0	14	0
Part 3: Dose schedule and route of administration of rabies vaccine	9	2	0	18	0
Total	20	2	0	40	0

Statistical Analysis Plan

Data was analyzed using appropriate statistical methods by SPSS (version 22).

For testing effect of age, sex, educational qualification and experience on pre test knowledge score independent sample T test was used.

Paired sample T test and McNemar’s matched ‘x²’ test were used for assessing impact of educational intervention on knowledge of rabies its mode of transmission and preventive measures.

Ethical Issues

Before starting study West Bengal Voluntary Health Association, Kolkata authority was informed about nature and purpose of study in writing. Prior written permission was obtained from appropriate West Bengal Voluntary Health Association authority, for conducting intervention study among health workers under training in this institution

This research study was institution based and interventional in nature. All participants of study were made aware about the nature and purpose of the research study. It was also informed to all the participants that all data will be kept confidential and will be used only for research or academic purpose. The participants were made aware accordingly about the importance of study and that it was for the benefit of the community. Informed consent for participation of the study population was obtained by the researchers

RESULT

Among the total of 92 participants 29.3% were males and 70.7% were females. Their mean age was 36.14 year (± 7.294). Among all participants only 3.3% had educational qualification below Secondary level, 62% had educational qualification at Secondary or Higher Secondary level and 34.7% were either graduate or above. Mean

year of working experience of the participants was 4.123 year (± 3.5). 16.3% participants had previous experience of managing dog bite case and 18.5% participants had seen rabies patient previously. (Table 1)

Pre intervention Knowledge score was not influenced by age of the participants but it was significantly more among males than females. Pre intervention knowledge score was influenced by educational level of the participants. Mean difference of knowledge score between more educated Participants (Graduate and above) and relatively less educated participants (Higher Secondary and below) was 4.7 which was statistically significant (P value= 0.000).

Pre intervention Knowledge score was also significantly affected by experience of participants in form of experience of managing dog bite case (P value= 0.03) and

experience on seeing rabies patient (P value= 0.004). (Table 2)

Table 1: Socio-demographic characteristics and training experience of the study population (n=92)

Variable	Mean (\pm SD) or No. (%)
Age:	36.14 (± 7.294)
Age group:	
<30 years:	12 (13)
30-39 years:	53 (57.6)
40-49 years:	21 (22.8)
≥ 50 years:	6 (6.5)
Sex :	
Male:	27 (29.3)
Female:	65 (70.7)
Educational qualification:	
Below Secondary:	3 (3.3)
Secondary And Higher Secondary:	57 (62)
Graduate and Post Graduate:	32 (34.7)
Working experience (in years):	4.123 (± 3.5)
Experience in caring dog bite case :	
Yes:	15 (16.3)
No:	77 (83.7)
Experience in seeing rabies patient :	
Yes:	17 (18.5)
No:	75 (81.5)

Table 2: Association of age, gender, educational qualification and working experience on pre intervention knowledge score: (n=92)

	Pre Intervention Knowledge Score : Mean (\pm SD)	Mean Difference	t	Sig
<u>Age :</u> >36 year: (mean age 36.4) ≤ 36 year:	18.7(± 7.56) 17.9(± 4.4)	0.8	0.59	0.558
<u>Gender:</u> Male : Female:	20.5(± 5.2) 17.3(± 5.9)	3.2*	2.5	0.014
<u>Education:</u> Graduate and above: Higher Secondary and below:	21.31(± 5.2) 16.57(± 5.5)	4.7*	3.999	0.000
<u>Experience on caring Dog bite case:</u> Yes: No:	21.2 (± 4.6) 17.64(± 5.9)	3.56*	2.203	0.03
<u>Experience on seeing rabies patient:</u> Yes: No:	21.9 (± 4.8) 17.4 (± 5.8)	4.5*	2.982	0.004

* Difference in table 2 is statistically significant (P value <0.05)

Out of 92 participants 1 was missing during post intervention knowledge test. Rest 91 participants were assessed regarding the improvement of knowledge on rabies agent and modes of transmission, different categories of bite and their management and dose schedule and route of administration of rabies vaccine 14 days after educational intervention. Number of respondents giving correct answer were more for all 20 items in comparison to pre intervention knowledge test (as shown in Table 3) and these differences was statistically significant by

McNemar's matched 'x²' Test (P value <0.05).

Average Difference of post and pre intervention knowledge score on rabies agent and mode of transmission was 1.239 (P value= 0.000). Mean improvement of knowledge score on different categories of bite and their management was 5.326 (P value= 0.000). Similarly average improvement of knowledge regarding dose schedule and route of administration of rabies vaccine was 9.587 (P value= 0.000).

Total mean knowledge score was improved by 16.174 points (P value= 0.000).(Table 4)

Table 3 : Impact of educational intervention on knowledge of respondents by McNemar's matched 'x²' test n=91 (as 1 participant was missing during post test response)

Question	Correct response in Pre test No (%)	Correct response in Post test No (%)	Exact Sig. (2-sided):
Part. I: Questionnaire on rabies agent and mode of transmission			
Causative agent of rabies	75 (82.4%)	90 (98.9%)	0.000
Fatality in rabies	62 (68.1%)	90 (98.9%)	0.000
Most important animal source of rabies in India	90 (98.9%)	91 (100%)	
Most infectious body fluid of rabid animal	78 (85.7%)	90 (98.9%)	0.002
Part. II: Questionnaire on different category of bite and their management			
Management of a person whose not injured skin, was licked by a rabid animal	26 (28.6%)	51 (56.0%)	0.000
Management of a person with minor scratch or abrasions by rabid animal without any bleeding	52 (57.1%)	71 (78.0%)	0.002
Management of a person with single or multiple transdermal bite scratch by a rabid animal or with licks of rabid animal on non intact skin or mucous membrane	45 (49.5%)	82 (90.1%)	0.000
Most dangerous part of the body for animal bite	55 (60.4%)	90 (98.9%)	0.000
Number of days a suspected domestic rabid animal should be observed after bite	10 (11.0%)	77 (84.6%)	0.000
Contraindication of rabies vaccine	29 (31.9%)	85 (93.4%)	0.000
Procedure of wound care	75 (82.4%)	89 (97.8%)	0.001
Part. III: Questionnaire on dose schedule and route of administration of rabies vaccine			
Site of administration of IM rabies vaccine in adult	43 (47.3%)	88 (96.7%)	0.000
Site of administration of intradermal rabies vaccine	37 (40.7%)	81 (89.0%)	0.000
Dose (per inj.) in case of IM regimen	28 (30.8%)	73 (80.2%)	0.000
Dose (per inj.) in case of intradermal regimen	17 (18.7%)	62 (68.1%)	0.000
Schedule of IM regimen for previously unvaccinated people	32 (35.2%)	70 (76.9%)	0.000
Schedule of Intradermal regimen for previously unvaccinated people	9 (9.9%)	60 (65.9%)	0.000
Schedule for previously vaccinated people	20 (22.0%)	76 (83.5%)	0.000
Post exposure prophylaxis regimen is currently practiced in govt. Setup	26 (28.6%)	76 (83.5%)	0.000
Type of needle and syringe is used in intradermal regimen	17 (18.7%)	62 (68.1%)	0.000

All differences in table 3 are statistically significant (P value <0.05)

Table 4. Comparison between pre intervention knowledge score of participants with post intervention knowledge score by paired samples T test

	Mean	SD	Mean Difference	95% Confidence Interval of the Difference		t	Sig (2-tailed)
				Upper	Lower		
Post intervention knowledge score on rabies agent and mode of transmission	7.93	0.357	1.23	1.551	.927	7.885	.000
Pre intervention knowledge score on rabies agent and mode of transmission	6.70	1.435					
Post intervention knowledge score on different category of bite and their management	12.00	2.498	5.33	5.965	4.687	16.558	.000
Pre intervention knowledge score on different category of bite and their management	6.67	2.833					
Post intervention knowledge score on dose schedule and route of administration of rabies vaccine	14.46	4.001	9.59	10.62	8.555	18.451	.000
Pre intervention knowledge score on dose schedule and route of administration of rabies vaccine	4.87	4.047					
Post intervention knowledge total score	34.39	5.744	16.17	17.47	14.88	24.869	.000
Pre intervention knowledge total score	18.22	5.851					

All differences in table 4 are statistically significant (P value <0.05)

DISCUSSION

The current study outlines a lack of awareness and knowledge regarding rabies and its preventive measures amongst the

study subjects. Average pre intervention knowledge score was better for rabies agent and mode of transmission: 6.70(±1.435) (maximum possible total score 8). But it was

very for poor for different category of bite and their management: 6.67 (± 2.833) (maximum possible total score 14) and dose schedule and route of administration of rabies vaccine: 4.87 (± 4.047) (maximum possible total score 18). Average pre intervention total knowledge score was also not satisfactory: 18.22 (± 5.851) (Maximum possible total score 40). This pre intervention knowledge score was significantly more with increased educational level and working experience. Though 82.4% respondents knew that causative agent of rabies was virus, 98.9% were aware of main animal reservoir of the disease (i.e. dog) and 85.7% knew that main infective body fluid responsible for transmission was saliva but only 26.6%, 57.1% and 49.5% knew properly about the management of category I, II and III contact respectively. 47.3% Participants gave correct answer regarding site of administration of intramuscular rabies vaccine and 40.7% knew about site of administration of intradermal rabies vaccine. Among all participants 35.2% knew correctly about dose schedule of intramuscular rabies vaccine where as in case of intradermal vaccine it was only 9.9%.

Most of the studies conducted in different parts of the world among health care providers, medical and nursing students and even in physicians showed similar type of finding of deficiency of knowledge regarding rabies and its prevention.

A group of experts on rabies from seven Asian countries have highlighted a lack of awareness among general practitioners regarding rabies. ⁽⁷⁾ Studies regarding knowledge and practice of animal bite among general practitioners of Jamnagar city India have reported high level of knowledge among physicians with regard to vectors, causative organisms, incubation period, mode of transmission, or the case

fatality rates of the disease but there was an apparent lack of awareness among doctors regarding the appropriate management of animal bite wound and vaccine administration. ⁽⁸⁾

A study on clinical knowledge and attitudes of Turkish physicians toward rabies caused by animal bites concluded that 68% of the physicians in the study were not aware of the proper method for cleaning wounds as a first-line treatment in post exposure prophylaxis and 79% of the physicians did not know the correct doses of vaccines. ⁽⁶⁾

An intervention study on knowledge about rabies and its preventive measures among final year nursing students of a tertiary care hospital in central India showed that 21% of the students knew about the schedule of PEP, 15% knew about the correct site and route of the vaccine and only 4% knew about the dose of vaccine to be administered. ⁽⁹⁾

Another study on knowledge of animal bite management and rabies immunization among interns of a government medical college in Kolkata found out that among the total of 80 interns, 56.3% and 72.6% of interns did not categorize bites into single transdermal bite and licks on broken skin as Cat-III wound respectively. 12.5% of interns were aware of the intradermal route of vaccination. 10% of interns could correctly describe the PEP management of Cat-I wounds. ⁽¹⁰⁾

This study also shows a significant improvement of knowledge score of the participants following intervention. Average post intervention total knowledge score was 34.39 (± 5.744) where as it was 18.22 (± 5.851) prior to intervention. Following intervention 56%, 78% and 90.1% of participants gave correct response regarding the management of category I, II and III contact respectively which were significantly more in respect to pre

intervention test ($p < 0.001$). Regarding site of administration of intramuscular vaccine this improvement was 49.4 % ($p < 0.001$) and in case of Intradermal vaccine it was 48.3 % ($p < 0.001$). Improvement of knowledge regarding dose schedule of IM and ID vaccine were found in 41.7% and 56 % of respondents respectively ($p < 0.001$).

An intervention study on knowledge about rabies and its preventive measures among final year nursing students of a tertiary care hospital in central India showed knowledge regarding animal bites which transmit rabies improved by 86% ($p < 0.001$), mode of transmission by 49% ($p < 0.001$) and first aid measures undertaken following an animal bite by 12% ($p = 0.07$). 15% of the students knew about the correct site and route of PEP; post intervention 91% knew about it ($p < 0.001$), 87% increase was observed as regards the dose of vaccine to be administered ($p < 0.001$) and 73% students correctly knew about the PEP schedule post educational intervention ($p < 0.001$). This finding was almost similar to the present study.⁽⁹⁾

Strength:

- About 92 health workers who were providing health care service to the general mass could be gathered under one roof.
- Adequate, appropriate and high quality training could be given to them.
- Their participation was enthusiastic, dynamic and whole hearted which was evident in the interactive session following the training.

Limitations:

- The main limitation of this study is there was no control group to compare the knowledge between the intervention and non intervention group.

- Only one training could be provided. It is felt that for better retention of correct knowledge more than 1 such training is required.

CONCLUSION AND RECOMMENDATION

As rabies is a potential killer disease and there is heavy burden of animal bite (dog bite) cases in developing countries like India, appropriate knowledge regarding rabies and its prevention among health care providers specially among field level health workers (who are usually the first contact between health system and population) is very important. Unfortunately this knowledge is not satisfactory. But as shown in this study there is scope of significant improvement of knowledge with educational intervention. So for health workers in job high quality continuing medical education (CME) sessions should be organized on a regular basis.

REFERENCES

1. WHO factsheet number 99; updated September 2010. Available from: <http://www.who.int/mediacentre/factsheets/fs099/en>.(Accessed on:10/7/14)
2. Sudharshan MK, Madhusudana SN, Mahendra BJ, Rao NS. AshwathNarayana DH, Rahman SA et al. Assessing the burden of human rabies in India: results of a national multicenter epidemiological survey. Int J Infect Dis. 2007; 11: 29-35.
3. Song M, Tang Q, Wang DM, Mo ZJ, Guo SH, Li H, et al. Epidemiological investigations of human rabies in China. BMC Infect Dis 2009;9:210.
4. Salahuddin N, Jamali S, Ibraheem K, Sarda S. Awareness about rabies post exposure prophylaxis in Pakistan among patients and health careworkers: Results from an Asian Rabies Expert Bureau study. J Coll Physicians Surg Pak 2011; 21:491-494.

5. John K, Kazwala R, Mfinanga GS. Knowledge of causes, clinical features and diagnosis of common zoonoses among medical practitioners in Tanzania. BMC Infect Dis 2008; 8: 162.
6. Goänen I, Soysal A, Topuzog A, Bakir M. Clinical Knowledge and Attitudes of Turkish Physicians toward Rabies Caused by Animal Bites. Jpn J InfectDis 2011;64:382-390.
7. Dodet B. Preventing the incurable: Asian rabies experts advocate rabies control. Vaccine 2006;24:3045-3049.
8. Bhalla S. Knowledge and Practice among General Practitioners of Jamnagar city regarding Animal Bite. Indian J Community Med 2005;30:94-96.
9. Dixit S,Raghunath D, Bhagwat A et.al. Effect of educational intervention measures on knowledge about rabies and its preventive measures among final year nursing students of a tertiary care hospital in central India. Indian Journal of Community Health 2012; 24: 37-40
10. Choudhury R, Mukherjee A, Naskar S, Lahiri S.K. et.al. A study on knowledge of animal bite management and rabies immunization among interns of a government medical college in Kolkata. International Journal of Medicine and Public Health 2013; 3:17-20

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