

Original Research Article

## AWARENESS OF RABIES AMONG MBBS INTERNS: A CROSS-SECTIONAL STUDY IN A MEDICAL COLLEGE OF SOUTH INDIA

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**ABSTRACT:**

**Background:** Rabies is a vaccine-preventable, zoonotic, viral disease affecting the central nervous system that kills approximately 59,000 people every year throughout the world. In India, an estimated 17.4 million animal bites occur annually which accounts for an incidence of 1.7%, and an estimated 20,000 human rabies death occurs per annum. The majority of rabies cases are caused by rabid dog bites. The present study was conducted to assess the awareness of MBBS interns regarding epidemiology, prevention, and management of rabies in a medical college in South India. **Materials and methods:** A cross-sectional study was conducted in the Department of Community Medicine of a medical college over a period of two months among 107 MBBS Interns. A predesigned semi-structured study questionnaire was used to collect the relevant data on awareness of rabies. The information regarding epidemiology, prevention, and management of rabies among the study population was noted. Collected data were entered in a Microsoft Excel sheet and analyzed by using the software IBM SPSS version 26. The results were represented in the form of percentages and proportions. **Results:** The majority of the study participants were females 59 (55.1%) and the males were 48 (44.9%). The mean age of study participants was 23.2 years. Awareness of the causes of rabies transmission was 75.7% in this study. Only 60.7% of the study participants were having correct knowledge of recommended time for washing of wound after a dog bite. Awareness of the type of rabies vaccine regimen given by intradermal route was present in only 41.1% of the study participants. **Conclusion:** The present study findings concluded that there exists a certain gap in the awareness or knowledge regarding rabies vaccination and animal bite management among medical interns. Undergraduate-level teaching curriculum in wound care, pre-exposure prophylaxis, and PEP must be practically oriented.

**Keywords:** Rabies, medical students, awareness, knowledge, interns, dog bite, animal bite, rabies vaccination, PEP

**INTRODUCTION:**

Rabies is present on all the continents except Antarctica in more than 150 countries globally, with over 95% of human deaths occurring in Asia and Africa 40% of whom are children under 15 years of age.(1) Rabies is a 100% fatal disease that kills approximately 59,000 people every year throughout the world. This fatal vaccine-preventable disease claims one human life every 15 minutes and Asian countries contribute to nearly half of rabies deaths. According to WHO, proper PEP can prevent human rabies completely.(2) Based on the WHO-sponsored national multi-centric rabies survey, 2003, a projected estimate of annual human rabies incidence worked out to approximately 20,565 cases per year.(3) The majority of rabies cases (about 97%) are caused by rabid dog bites, followed by other animals such as cats, cows, monkeys, horses, pigs, and camels.(4) In India, an estimated 17.4 million animal bites occur annually which accounts for an incidence of 1.7%, and an estimated 20,000 human rabies death occurs per annum.(5,6) Rabies is transmitted to other animals and humans through close contact with saliva from infected animals by bites, scratches, and licks on broken skin and mucous membranes. Although a number of carnivorous animals serve as natural reservoirs, dogs are the main source of human infections and pose a potential threat to billions of humans.(2) With this background, the present study was conducted to assess the awareness of MBBS interns regarding epidemiology, prevention, and management of rabies in a medical college in South India.

**MATERIALS AND METHODS:**

A cross-sectional study was conducted in the Department of Community Medicine of Kamineni Institute of Medical Sciences, Narketpally, Telangana, India over a period of two months from May to June 2023. MBBS Interns of KIMS, Narketpally were the study population. The sample size for the current study was calculated by using a single population proportion formula  $n = Z^2 P(1-P)/e^2$  with a 95% confidence level ( $Z=1.96$ ) and a proportion of awareness ( $P$ ) 50% to get the maximum sample size and margin of error ( $e$ ) was assumed to be 10%. With a 10% non-response rate, the total sample size was found to be 107. Interns who had given consent were included in this study. Individuals who have not given consent were excluded from this study.

A predesigned semi-structured study questionnaire was used to collect the relevant data of awareness of rabies. Details such as age and gender of the study participants were collected. The information regarding epidemiology, prevention and management of rabies among the study population was noted. Data regarding awareness of rabies transmission, incubation period, case fatality rate, rabies vaccine and immunoglobulins, pre-exposure prophylaxis, PEP, and animal bite first aid were collected. The study was started after obtaining IEC clearance from the institute. After explaining the importance of the study to the participants, informed consent was obtained from them before administering the study questionnaire and they were assured of confidentiality throughout the study. Collected data were entered in a Microsoft Excel sheet and analyzed by using the software IBM SPSS (statistical package for social sciences) version 26. The results were represented in the form of percentages and proportions and depicted in tables.

**RESULTS:**

A total of 107 MBBS interns participated in this study. The majority of the study participants were females 59 (55.1%) and the remaining were males 48 (44.9%). Study participants belong to the age range of 21 to 26 years age with the mean age of study participants as 23.2 years. The study participants were having a good awareness of the epidemiology of rabies

with correct knowledge of pathognomic inclusion bodies of rabies (96.3%); causative virus family for rabies disease (92.5%); clinical features of rabies in dogs (88.8%); dangerous body site of dog bite as head (85%) and causes of rabies transmission (75.7%). There was low awareness observed among interns regarding the incubation period of rabies (56.1%) and the proportion of case fatality rate of rabies (63.6%). These were shown in Table 1.

**Table 1: Awareness regarding the epidemiology of rabies among the study population**

Awareness on rabies epidemiology	Present		Absent	
	n	%	n	%
Causes of rabies transmission	81	75.7	26	24.3
Causative virus family for rabies disease	99	92.5	8	7.5
The incubation period of rabies	60	56.1	47	43.9
Pathognomic inclusion bodies of rabies	103	96.3	4	3.7
The case fatality rate of rabies	68	63.6	39	36.4
Dangerous body site of dog bite	91	85.0	16	15.0
Clinical features of rabies in dogs	95	88.8	12	11.2

**Table 2: Awareness regarding the prevention of rabies among the study population**

Awareness on rabies prevention	Present		Absent	
	n	%	n	%
Rabies vaccine for category-I of rabies exposure	77	72.0	30	28.0
Rabies vaccine and immunoglobulin for pregnant or lactating mother	64	59.8	43	40.2
Vaccination against rabies for vaccinated dog bite	67	62.6	40	37.4
Type of rabies vaccine regimen given by intradermal route	44	41.1	63	58.9
Essens regimen of rabies vaccination	69	64.5	38	35.5
Group of people for pre-exposure prophylaxis for rabies	101	94.4	6	5.6

The study participants were having good awareness regarding the prevention of rabies with correct knowledge of a group of people for pre-exposure prophylaxis (94.4%) followed by the need for a rabies vaccine for category-I of rabies exposure (72%). There was low awareness regarding the type of rabies vaccine regimen given by intradermal route (41.1%) and whether rabies vaccine and immunoglobulin for pregnant or lactating mothers can be given or not (59.8%) among the study participants. The majority of the study participants (94.4%) were having awareness of pre-exposure prophylaxis for rabies among the group of people like veterinary doctors and nursing staff, street dog catchers, and people with pet dogs and cats at home in this study. These were depicted in Table 2.

**Table 3: Awareness regarding the management of rabies or animal bite among the study population**

Awareness on rabies or animal bite management	Present		Absent	
	n	%	n	%
Recommended time for washing of wound after dog bite	65	60.7	42	39.3
Covering of the animal bite wound with dressings or bandages	76	71.0	31	29.0
Post-exposure prophylaxis for touching or feeding animals, licks on intact skin, contact of intact skin with secretions or excretions of a rabid animal or human case.	61	57.0	46	43.0

Antimicrobials are prescribed to prevent possible bacterial infection in case of an animal bite	75	70.1	32	29.9
Category of rabies bites that require immunoglobulins	73	68.2	34	31.8
Administration of immunoglobulins	86	80.4	21	19.6
Type of rabies immunoglobulins having high hypersensitivity	78	72.9	29	27.1
Suturing of the lacerated wound caused by a pet dog	96	89.7	11	10.3
Person who already got pre-exposure prophylaxis, there is a need to get post-exposure prophylaxis after the dog bite	82	76.6	25	23.4

Table 3 shows that the majority of study participants were having correct knowledge of the management of rabies i.e. not suturing the lacerated wound caused by pet dog (89.7%) followed by correct administration of immunoglobulins (80.4%). There was a lower awareness on knowledge of post-exposure prophylaxis for touching or feeding animals, licks on intact skin, and contact of intact skin with secretions or excretions of a rabid animal or human case (57%) followed by a recommended time of 15 minutes for washing of wound after dog bite (60.7%). In our study, vaccination of thyself for the prevention of rabies was suggested by 40.2% of the study participants. The remaining have suggested vaccination of all dogs (59.8%).

## DISCUSSION:

The present study includes 107 MBBS interns at a private medical college in South India. The mean age of study participants was 23.2 years. This was similar to a study done by Deori TJ et al.(7) which showed the mean age of the participants was 23.4 (2 SD±1.8). The mean age of the interns was 23.5 years in a study done by Chowdhury R et al.(8). Majority of the study participants were females (55.1%) in our study. The majority of the study participants were males in other studies done by Chowdhury R et al.(8) (68.8%) and Deori TJ et al.(7) (61.3%). Knowledge of causes of rabies transmission was 75.7% in our study. Similar results were observed in a study by Das D et al.(9), which showed that nearly 74.7% of the students knew about the transmission mode. Whereas In another study done by Deori TJ et al.(7), most of the interns (96.9%) had correct knowledge of rabies transmission modes. A study done by Mali A et al.(10) among second-year medical students reported almost 90% of the students knew the mode of transmission regarding rabies, which is also higher than the present study. The majority (92.5%) were having correct knowledge of the causative virus family for rabies disease in the present study. The majority of the study participants (94.4%) were having awareness of pre-exposure prophylaxis for rabies in this study. Only 38.8% of study participants knew about pre-exposure prophylaxis in a study done by Deori TJ et al.(7). Awareness of case fatality rate of rabies of 100% was revealed by about 63.6% of interns in this study.

About 72% of the study participants were having correct awareness of the rabies vaccine was not recommended for category-I of rabies exposure in this study. Deori TJ et al.(7) study revealed that 70% of the interns had knowledge about the categorization of the dog bite. Whereas in another study by Chowdhury R et al.(8), the majority (95%) of them correctly classified touching of animals as Category I wounds and about 87.5% of the interns thought that licks on intact skin by rabid animals were Category I, Only 10% of the interns in their study noted the correct recommendations regarding vaccination and immunoglobulin administration in Category I wounds. In the present study, knowledge of the type of rabies vaccine regimen given by intradermal route as red cross regimen was present in only 41.1% of the study participants. Awareness about 15 minutes of the recommended time for washing

of wound after a dog bite was present in only 60.7% of interns in this study. A study done by Das D et al.(9) among medical students of government medical college, reported that 36.1% of the students had correct knowledge regarding washing the wound with soap and water. First aid knowledge of not covering the animal bite wound with dressings or bandages was observed in about 71% of the study participants in this study. Most of the interns (93.8%) knew about the first aid treatment for the dog bite in a study done by Deori TJ et al.(7).

Knowledge on post-exposure prophylaxis for touching or feeding animals licks on intact skin, and contact of intact skin with secretions or excretions of a rabid animal or human case was seen in only 57% of interns in this study. About 71.3% of interns knew about PEP of rabies and only 46.3% knew about in which cases PEP is contraindicated in a study done by Deori TJ et al.(7). In this study, about 68.2% of the interns were having correct knowledge of the category of rabies that need the immunoglobulin administration. Awareness of the correct administration of immunoglobulins is seen in 80.4% of the study participants in this study. Deori TJ et al.(7) study showed that only 50% of the interns knew when RIG could be given after the first dose of the anti-rabies vaccine. Chowdhury R et al. (8) study revealed that only 22.5% of the interns recommended the use of ERIG at the wound site, while 25% recommended the use of HRIG at the wound site. The majority of the interns did not know the exact dose or the exact site of ERIG or HRIG administration. Gaps have been found in the use of immunoglobulin with most interns not familiar with the dose and site of immunoglobulin administration. Also, knowledge regarding rabies immunization in special situations was low in their study. Correct knowledge of lacerated wounds caused by pet dog which should not be sutured is seen in 98.7% of the interns in this study. Similar findings of 83.8% correct knowledge regarding suturing were observed in a study done by Chowdhury R et al. (8). About 76.6% of the interns were having correct knowledge regarding the person who already got pre-exposure prophylaxis and there is a need for post-exposure prophylaxis after the dog bite. With timely and correct postexposure prophylaxis (PEP) for these animal bite victims, rabies can be prevented.(11)

Rabies is unvaryingly fatal and possibly the most painful and dreadful of all communicable diseases in which the infected person is tortured at the same time with thirst and fear of water (hydrophobia). Fortunately, rabies can be prevented if animal bites are managed aptly and in time. In this regard, the post-exposure treatment of animal bite cases is of prime importance.(12) There are about 1.7% of animal bites in India every year, (3) mostly from stray animals. A thorough knowledge regarding the management of animal bites and rabies vaccination is a must for all physicians, in order to prevent the development of human rabies. A group of experts on rabies from seven Asian countries has highlighted a lack of awareness among general practitioners regarding rabies.(13) Studies from India (14) and other countries in Southeast Asia (15) have reported a 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 very few studies reported on the knowledge of physicians regarding animal bite management and rabies prophylaxis. The lack of proper knowledge of animal bite management and rabies vaccination can on one hand lead to inadequate vaccinations resulting in increased risk of development of human rabies or unnecessary vaccination and immunoglobulin administration causing unnecessary governmental or out-of-pocket expenses by the patient and possible side effects.(8) Narayan K.G. suggested a definite programme for control of the dog population in an integrated approach involving environmental measures to reduce habitat, proper garbage disposal, discouraging community-owned dogs, helping dog catching squad, castration, promoting industrial utilization of dog carcasses to help reduce the dog population.(16) A One health approach as suggested by WHO assures the engagement of

multiple sectors and local communities to build awareness and conduct mass dog vaccination campaigns.(1) Limitations of the present study were the small sample size and this was a single centered study conducted involving only interns.

### CONCLUSION:

Based on the study findings, we conclude that there exists a certain gap in the awareness or knowledge regarding rabies vaccination and animal bite management among medical interns. This was likely due to the absence of an animal bite clinic offering management and immunizations for animal bites at the medical institution where the study was conducted. Instead, patients were directed to treatment facilities with specialized care. The majority of students would not have received enough exposure to rabies vaccinations and animal bite management without animal bite clinics. Animal bite cases are common in India at all levels of public and private healthcare delivery, hence undergraduate-level teaching curriculum in wound care, pre-exposure prophylaxis, and PEP must be practically oriented.

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**Conflicting Interest:** None declared

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