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Original Research Article

A cross-sectional study on knowledge of epidemiological determinants, prevention and management of rabies among MBBS interns of a tertiary health care center of central India

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ABSTRACT

Background: According to World Health Organization (WHO), rabies is a vaccine-preventable, zoonotic, viral disease caused by Lyssavirus type 1. It causes 20,000 deaths annually in India. MBBS interns represent the physicians who will graduate and practice medicine from next year. Hence, keeping this in mind, the present study was carried out to assess the knowledge regarding epidemiological determinants, prevention and management of rabies among MBBS interns.
Methods: A cross-sectional study was conducted between April 2023 to June 2023 among 200 MBBS interns of Indira Gandhi Government Medical College, Nagpur, Maharashtra. Data was collected by the self-administered, pre-designed, pre-structured questionnaire and was analysed using statistical package for the social sciences (SPSS) software version 25.
Results: It was seen that the mean age of participants was 23.34 (±0.859) years. The majority of participants were males (51.5%). The majority (80%) of interns knew the correct causative agent of rabies, while only 40% knew the correct incubation period of rabies. The majority, that is 63.5%, 85.5% and 75% of interns, knew the correct route, site and schedule of post exposure prophylaxis (PEP) respectively. Only 26.5% interns knew the correct management of category I animal bites, while 74.5% and 89% knew the correct management of category II and category III animal bites, respectively. The mean total knowledge score among interns was 13.17±2.63.
Conclusions: The study found that interns with experience in dealing with animal bite cases had significantly higher total knowledge scores. To improve knowledge, interactive animal bite case-dealing sessions and regular CMEs should be conducted.

Keywords: Knowledge, Epidemiological determinants, Prevention, Management, Rabies, Interns

INTRODUCTION

According to the World Health Organisation (WHO), rabies is a vaccine-preventable, zoonotic, viral disease affecting the central nervous system. It is also known as hydrophobia and is caused by Lyssavirus type 1. It is primarily a zoonotic disease of warm-blooded animals, particularly carnivorous such as dogs, cats, jackals, and wolves. Dogs are the main source of human rabies deaths, contributing up to 99% of all rabies transmissions to humans.[1] Once clinical symptoms appear, rabies is virtually 100% fatal.[1] It spreads to people and animals via saliva, usually through bites, scratches, or direct contact with mucosa (e.g., eyes, mouth, or open wounds).[1] The incubation period for rabies is typically 2–3 months but may vary from 1 week to 1 year, depending on factors such as the location of virus entry and the viral load.[1] Initial symptoms of rabies include generic signs like fever, pain and unusual or unexplained tingling, pricking, or burning sensations at the wound site. As the virus moves to the central nervous system, progressive and fatal inflammation of the brain and spinal cord develops.[1] Very effective

vaccines are available to immunize people after an exposure as post exposure prophylaxis (PEP).[1] As per WHO, every year, more than 29 million people worldwide receive PEP.[1] PEP prevents the virus from entering the central nervous system, which would invariably result in death. PEP consists of extensive washing with water and soap for at least 15 minutes and local treatment of the wound as soon as possible after a suspected exposure; a course of potent and effective rabies vaccine that meets WHO standards; and the administration of rabies immunoglobulin or monoclonal antibodies into the wound, if indicated.[1] Rabies is a major public health problem in India. It occurs in all parts of the country with the exception of Lakshadweep, Andaman and Nicobar Island.[2] The vast majority of the estimated 55,000 deaths caused by rabies each year occur in rural areas of Africa and Asia.[2] In India alone, 20,000 deaths (that is, about 2 per lac population at risk) are estimated to occur annually.[2] Since rabies is not a notifiable disease in India and there is no organized surveillance system of human or animal cases, the actual number of deaths may be much higher. Inadequate knowledge of the classification of animal bite wounds leads to incorrect vaccination in different countries around the world, including India. 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 addition, there are cases of human rabies reported as a result of stray dog bites treated with vaccines but without immunoglobulin. MBBS interns are expected to have sufficient knowledge of the epidemiological determinants, prevention and management of rabies. These interns represent the physicians who will graduate and practice medicine next year. Therefore, they are expected to play an imperative role in limiting the increasing number of cases of this fatal zoonotic disease in humans and in promoting health education in India. Hence, the present study was carried out with the objective of studying the knowledge regarding epidemiological determinants, prevention and management of rabies among MBBS interns and to study the association of gender and experience in dealing with an animal bite case with the intern's knowledge.

METHODS

Study design and setting

A cross-sectional study was conducted among 200 MBBS interns of Indira Gandhi Government Medical College, Nagpur between April 2023 to June 2023.

Study population

The study population consisted of interns who have completed their MBBS and are currently doing internship at the study institute. There were two batches of interns available during the study period, that is, 2022 and 2023 internship batches. Interns who gave consent for participation from both batches were included in the study until the sample size was achieved, and those who were not willing to participate were excluded. Ultimately, 56 interns from 2022 and 144 interns from the 2023 internship batch participated in the study, making it a total of 200 study participants.

Questionnaire

Data was collected by the self-administered, pre-designed, pre-structured questionnaire. The questionnaire was divided into five sections: socio-demographic details, basic details (including academic details like internship batch and experience in dealing with an animal bite case), knowledge regarding epidemiological determinants of rabies (6 questions), knowledge regarding prevention of rabies (4 questions) and knowledge regarding management of rabies (9 questions), making it a total of 19 knowledge questions. All participants were given a fixed time to fill out the questionnaire and were observed throughout the process to limit the chances of cheating or searching for answers on the internet.

Knowledge regarding the epidemiological determinants of rabies included questions on the causative agent, incubation period, mode of transmission, reservoir of infection and symptoms of rabies infection. Knowledge regarding the prevention of rabies included questions on the site of anti-rabies vaccine (ARV), route of ARV, schedule of post exposure prophylaxis (PEP) and whether ARV was included in the National Immunisation Schedule (NIS) or not.

Knowledge regarding the management of rabies included questions on the categorization of animal bites, wound management, management of different categories of animal bites as per guidelines and dose of equine rabies immunoglobulin (ERIG) and human rabies immunoglobulin (HRIG).

Study variables

Intern's knowledge regarding various domains of epidemiological determinants, prevention and management of rabies in the form of correct or incorrect answers were the outcome/dependent variables. The independent variables included gender (male/female) and experience in dealing with an animal bite case (yes/no).

Sample size estimation

From a study conducted by Giri et al taken as reference, taking the prevalence of correct knowledge of the incubation period of rabies in human as 75% and absolute error as 6%, the sample size estimated was 200.08.[4] The final sample size was rounded off to 200.

Data analysis

After the collected data were checked for completeness, clarity, and accuracy, it was exported to statistical package

for social sciences (SPSS) version 25 for analysis. The characteristics of the study participants were analysed using descriptive statistics and expressed in terms of number and percentage (qualitative variables) and mean and standard deviation (quantitative variables). The Chi-square test was used to find associations between the categorical independent and dependent variables. The normal distribution of data was evaluated using the Shapiro-Wilk test, kurtosis and skewness measurements, and then an independent t-test was used to compare means between independent groups. Next, we used multivariate binary logistic regression analyses to predict the relationship between dependent variables and independent variables. Models were made separately for each outcome variable with both independent variables. Out of all these models, those with AIC<500 and pseudo-R2>O.15 were considered fit and results for only those models were reported in the form of odds ratio, 95% confidence interval and p value. A p value of <0.05 was considered statistically significant.

RESULTS

Table 1 shows the socio-demographic profile of study participants. It was found that the mean and standard deviation of age was 23.34±0.859 years (minimum=21 years, maximum=25 years), and the majority of participants were 23 years old. The majority of participants were males (51.5%), belonged to the Hindu religion (87%) and resided inside the hospital campus (67%).

Table 1: Distribution of study participants according to their sociodemographic profile.

Socio-demographic profile	N	%
Age (years)		
21	3	1.5
22	23	11.5
23	96	48.0
24	59	29.5
25	19	9.5
Gender		
Male	103	51.5
Female	97	48.5
Current residence		
Inside hospital campus	134	67
Outside hospital campus	66	33
Religion		
Hindu	174	87
Bouddha	15	7.5
Muslim	04	2
Sikh	02	1
Christian	04	2
Others	01	0.5

Figure 1 shows the distribution of study participants according to experience in dealing with animal bite case, it was found that 114 (57%) of interns have dealt with animal bite case, while 86 (43%) haven't dealt with any animal bite case.

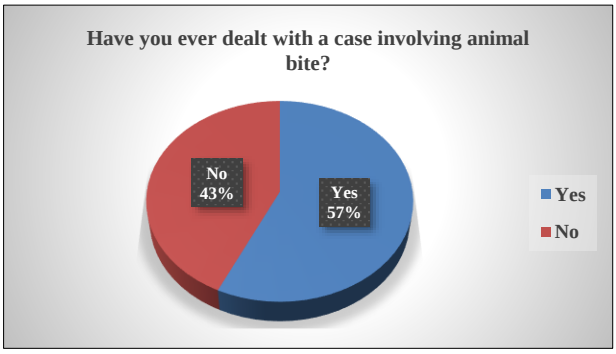

Figure 1: Distribution of study participants according to experience in dealing with an animal bite case.

Table 2 shows knowledge regarding the epidemiological determinants of rabies. It was seen that 160 (80%) of interns were aware of the lyssavirus as the causative agent of rabies. Eighty (40%) of interns knew the correct incubation period for rabies, which is 1-3 months. The majority of participants, that is, 130 (65%) knew that the incubation period depends on the amount of virus injected, the site and severity of the bite and the species of the biting animal. One eighty-three (91.5%) knew the correct reservoir of rabies infection, that is, dogs and other warm-blooded animals and 147 (73.5%) of interns knew the correct mode of transmission of rabies which is via bites, licks and scratches of infected animals. The majority, that is, 81 (40.5%) of interns said that aerophobia, photophobia and hydrophobia are the only symptoms of rabies while only 34 (17%) correctly pointed out that fever, sore throat, malaise, irritability, depression, fear of death, anger, aerophobia, photophobia, hydrophobia and tingling at the site of bite are the symptoms of rabies.

Table 3 shows the knowledge regarding the prevention of rabies. It was found that 127 (63.5%) of interns knew the correct route of ARV, that is, IM/ID, and 171 (85.5%) knew the correct site of ARV administration, that is, deltoid. One hundred fifty (75%) knew the correct schedule of PEP and 172 (86%) knew correctly that ARV is not included in NIS.

Table 4 shows the knowledge regarding the categorization of animal bites. It was found that 174 (87%) correctly classified touching or feeding animals, licking on intact skin and nibbling of uncovered skin as category I bite. One seventy-two (86%) correctly classified minor scratches or abrasions without bleeding as category II bites while 168 (84%) correctly classified single or multiple transdermal bites or scratches and licks on broken skin as category III bites.

Table 5 shows the knowledge regarding the management of different categories of animal bites. It was found that only 53 (26.5%) of the interns in the present study knew

the correct management for category I animal bite as doing nothing if reliable history is present, while 149 (74.5%) knew the correct management for category II animal bite as wound management and vaccine and 178 (89%) knew the correct management for category III animal bite as wound management and vaccine + rabies immunoglobulin (RIG).

Table 2: Distribution of study participants according to knowledge regarding the epidemiological determinants of rabies.

Variables	N	%
Causative agent		
Adenovirus	15	7.5
Coxsackie	06	3.0
Flavivirus	19	9.5
Lyssavirus	160	80
Incubation period		
1-3 months	80	40
10-20 days	54	27
3 weeks to many years	48	24
6 months to 5 years	18	9.0
The incubation period depends upon		
Amount of virus injected	22	11
Site and severity of bite	42	21
Species of biting animal	6	3
All of the above	130	65
Reservoir of infection		
Dogs and other warm-blooded animals	183	91.5
Only dogs	17	8.5
Mode of transmission		
Bites, licks, scratches of an infected animal	147	73.5
Inhalation of virus-containing aerosol	00	00
Ingestion of raw meat or milk from an infected animal	00	00
All of the above	53	26.5

Table 3: Distribution of study participants according to knowledge regarding the prevention of rabies.

Variables	N	%
Route of ARV		
Intradermal (ID)	25	12.5
Intramuscular (IM)	43	21.5
IM/ ID	127	63.5
Don’t know	05	2.5
Site of ARV		
Deltoid	171	85.5
Gluteus	11	5.5
Abdomen	07	3.5
Thigh	04	2.0
Don’t know	07	3.5
Schedule of PEP		
Correct answer	150	75
Incorrect answer	50	25
Is ARV included in NIS		
Yes	28	14.0
No	172	86.0

Table 4: Distribution of study participants according to knowledge regarding the categorization of animal bites.

Categorization of animal bite	Category I N (%)	Category II N (%)	Category III N (%)	Don't know N (%)	Guidelines
Touching or feeding animals, licking on intact skin, nibbling of uncovered skin come under which category	174 (87)	20 (10)	00 (0)	06 (3)	Category I
Minor scratches or abrasions without bleeding	24 (12)	172 (86)	00 (0)	04 (2)	Category II
Single or multiple transdermal bites or scratches, licks on broken skin	02 (1)	27 (13.5)	168 (84)	03 (1.5)	Category III

Table 5: Distribution of study participants according to knowledge regarding the management of different categories of animal bites as per guidelines.

Catego -ry	WM	V	RIG	WM+V	WM+V +RIG	WM+RIG	V+RIG	Nothing if reliable history	Don't know
Cat I	78 (39)	10 (5)	3 (1.5)	38 (19)	4 (2)	4 (2)	3 (1.5)	53 (26.5)	7 (3.5)
Cat II	1 (0.5)	4 (2)	2 (1)	149 (74.5)	34 (17)	1 (0.5)	1 (0.5)	1 (0.5)	7 (3.5)
Cat III	0 (0)	0 (0)	0 (0)	5 (2.5)	178 (89)	4 (2)	6 (3)	0 (0)	7 (3.5)

W-wound management, V-vaccine, RIG-rabies immunoglobulin.

Table 6 shows knowledge regarding the dose of ERIG and HRIG. It was found that 131 (65.5%) and 143 (71.5%) knew the correct dose of ERIG and HRIG as 40 IU/kg and 20 IU/kg, respectively.

Table 7 shows the association of gender and intern's knowledge, it was found that there were statistically significant differences in knowledge regarding the categorization of minor scratches or abrasions without bleeding, management of category III animal bites, wound management and dose of HRIG between male and female interns.

Table 8 shows the association of experience in dealing with animal bite case and intern's knowledge, it was found that there were statistically significant differences in knowledge regarding the causative agent of rabies, symptoms of rabies, site for ARV, route of ARV, categorization of minor scratches or abrasions without bleeding, management of category I animal bite and dose of ERIG between interns who have dealt with animal bite case and interns who haven't dealt with any animal bite case.

Table 9 shows results of logistic regression, it was found that compared to females, males had 1.05 (OR=1.05, 95% CI 0.49–2.23, p value=0.9), 1.04 (OR=1.04, 95% CI 0.44–2.46, p value=0.93), 1.06 (OR=1.06, 95% CI 0.59–1.9, p value=0.85), and 1.65 (OR=1.65, 95% CI 0.9–3.0, p value=0.104) times higher chances of giving the correct answer for symptoms of rabies, site of ARV, route of ARV, and dose of ERIG respectively while compared to females, males had 0.57 (OR=0.57, 95% CI 0.3–1.1, p value=0.09) and 0.23 (OR=0.23, 95% CI 0.06–0.85, p value=0.028*) times lesser chances of giving the correct answer for management of category I and category III animal bite respectively. Also compared to those who had never dealt with any animal bite case, interns who had dealt were having 15.96 (OR=15.96, 95% CI 4.62–55.15, p value<0.001*), 1.94 (OR=1.94, 95% CI 1.07–3.49, p value=0.028*), 2.28 (OR=2.28, 95% CI 1.15–4.5, p value=0.018*), 3.1 (OR=3.1, 95% CI 0.98–9.87, p value=0.055) and 2.2 (OR=2.2, 95% CI 1.21–4, p value=0.01*) times higher chances of giving the correct answer for the site of ARV, route of ARV, management of category I animal bite, management of category III animal bite and the dose of ERIG, respectively while 0.4 (OR=0.4, 95% CI 0.18–0.85, p value=0.018*) times lesser chance of giving the correct answer for symptoms of rabies.

Table 6: Distribution of study participants according to knowledge regarding the dose of ERIG and HRIG.

Type of RIG	Dose (IU/kg)		
	20 IU/kg	**40 IU/kg**	**Don't know**
ERIG	41(20.5)	131(65.5)	28 (14)
HRIG	143 (71.5)	38 (19)	19 (9.5)

Table 7: Association of gender and intern's knowledge.

Variables	Correct answer, N (%)			Incorrect answer, N (%)			χ^2 value P value
	Male (n=103)	Female (n=97)	Total	Male (n=103)	Female (n=97)	Total	
Causative agent of rabies	83 (80.6)	77 (79.4)	160 (80)	20 (19.4)	20 (20.6)	40 (20)	χ^2=0.045 p=0.832
Incubation period of rabies	45 (43.7)	35 (36.1)	80 (40)	58 (56.3)	62 (63.9)	120 (60)	χ^2=1.204 p=0.272
Incubation period of rabies depends upon	71 (68.9)	59 (60.8)	130 (65)	32 (31.1)	38 (39.2)	70 (35)	χ^2=1.443 p=0.230
Reservoir of infection	95 (92.2)	88 (90.7)	183 (91.5)	8 (7.8)	9 (9.3)	17 (8.5)	χ^2=0.147 p=0.702
Mode of transmission of rabies	75 (72.8)	72 (74.2)	147 (73.5)	28 (27.2)	25 (25.8)	53 (26.5)	χ^2=0.051 p=0.821
Symptoms of rabies	17 (16.5)	17 (17.5)	34 (17)	86 (83.5)	80 (82.5)	166 (83)	χ^2=0.037 p=0.848
Site for ARV	90 (87.4)	81 (83.5)	171 (85.5)	13 (12.6)	16 (16.5)	29 (14.5)	χ^2=0.605 p=0.437
Route of ARV	67 (65)	60 (61.9)	127 (63.5)	36 (35)	37 (38.1)	73 (36.5)	χ^2=0.220 p=0.639
Is anti-rabies vaccination included in NIS?	92 (89.3)	80 (82.5)	172 (86)	11 (10.7)	17 (17.5)	28 (14)	χ^2=1.945 p=0.163
Schedule of PEP	77 (74.8)	73 (75.3)	150 (75)	26 (25.2)	24 (24.7)	50 (25)	χ^2=0.007 p=0.935
Touching or feeding animals, licking on intact skin, nibbling of uncovered skin come under which category?	92 (89.3)	82 (84.5)	174 (87)	11 (10.7)	15 (15.5)	26 (13)	χ^2=1.011 p=0.315
Minor scratches or abrasions without bleeding come under which category?	94 (91.3)	78 (80.4)	172 (86)	9 (8.7)	19 (19.6)	28 (14)	χ^2=4.884 p=0.027*
Single or multiple transdermal bites or scratches, licks on broken skin come under which category?	82 (79.6)	86 (88.7)	168 (84)	21 (20.4)	11 (11.3)	32 (16)	χ^2=3.043 p=0.081
Management of category I animal bite	23 (22.3)	30 (30.9)	53 (26.5)	80 (77.7)	67 (69.1)	147 (73.5)	χ^2=1.896 p=0.169
Management of category II animal bite	74 (71.8)	75 (77.3)	149 (74.5)	29 (28.2)	22 (22.7)	51 (25.5)	χ^2=0.788 p=0.375
Management of category III animal bite	92 (89.3)	94 (96.9)	186 (93)	11 (10.7)	3 (3.1)	14 (7)	χ^2=4.417 p=0.036*
Wound management	63 (61.2)	40 (41.2)	103 (51.5)	40 (38.8)	57 (58.8)	97 (48.5)	χ^2=7.942 p=0.005*
Dose of ERIG	74 (71.8)	57 (58.8)	131 (65.5)	29 (28.2)	40 (41.2)	69 (34.5)	χ^2=3.783 p=0.052
Dose of HRIG	80 (77.7)	63 (64.9)	143 (71.5)	23 (22.3)	34 (35.1)	57 (28.5)	χ^2=3.967 p=0.046*

*P value <0.05

Table 8: Association of experience in dealing with an animal bite case and intern's knowledge.

Variables	Correct answer, N (%)			Incorrect answer, N (%)			χ^2 value P value
	Dealt with animal bite case (n=114)	Didn't deal with animal bite cases (n=86)	Total	Dealt with animal bite case (n=114)	Didn't deal with animal bite cases (n=86)	Total	
Causative agent of rabies	101 (88.6)	59 (68.6)	160 (80)	13 (11.4)	27 (31.4)	40 (20)	χ^2=12.245 p=0.000*
Incubation period of rabies	52 (45.6)	28 (32.6)	80 (40)	62 (54.4)	58 (67.4)	120 (60)	χ^2=3.482 p=0.062
Incubation period of rabies depends upon	71 (62.3)	59 (68.6)	130 (65)	43 (37.7)	27 (31.4)	70 (35)	χ^2=0.862 p=0.353
Reservoir of infection	107 (93.9)	76 (88.4)	183 (91.5)	7 (6.1)	10 (11.6)	17 (8.5)	χ^2=1.898 p=0.168
Mode of transmission of rabies	83 (72.8)	64 (74.4)	147 (73.5)	31 (27.2)	22 (25.6)	53 (26.5)	χ^2=0.065 p=0.798
Symptoms of rabies	13 (11.4)	21 (24.4)	34 (17)	101 (88.6)	65 (75.6)	166 (83)	χ^2= 5.885 p=0.015*
Site for ARV	111 (97.4)	60 (69.8)	171 (85.5)	3 (2.6)	26 (30.2)	29 (14.5)	χ^2=30.122 p=0.000*
Route of ARV	80 (70.2)	47 (54.7)	127 (63.5)	34 (29.8)	39 (45.3)	73 (36.5)	χ^2= 5.097 p=0.024*
Is anti-rabies vaccination included in NIS?	102 (89.5)	70 (81.4)	172 (86)	12 (10.5)	16 (18.6)	28 (14)	χ^2= 2.657 p=0.103
Schedule of PEP	85 (74.6)	65 (75.6)	150 (75)	29 (25.4)	21 (24.4)	50 (25)	χ^2= 0.027 p=0.869
Touching or feeding animals, licking on intact skin, nibbling of uncovered skin come under which category?	102 (89.5)	72 (83.7)	174 (87)	12 (10.5)	14 (16.3)	26 (13)	χ^2=1.434 p=0.231
Minor scratches or abrasions without bleeding come under which category?	105 (92.1)	67 (77.9)	172 (86)	9 (7.9)	19 (22.1)	28 (14)	χ^2=8.208 p=0.004*
Single or multiple transdermal bites or scratches, licks on broken skin come under which category?	94 (82.5)	74 (86)	168 (84)	20 (17.5)	12 (14)	32 (16)	χ^2=0.470 p=0.493
Management of category I animal bite	37 (32.5)	16 (18.6)	53 (26.5)	77 (67.5)	70 (81.4)	147 (73.5)	χ^2=4.829 p=0.028*
Management of category II animal bite	88 (77.2)	61 (70.9)	149 (74.5)	26 (22.8)	25 (29.1)	51 (25.5)	χ^2=1.012 p=0.314
Management of category III animal bite	109 (95.6)	77 (89.5)	186 (93)	5 (4.4)	9 (10.5)	14 (7)	χ^2=2.783 p=0.095
Wound management	57 (50)	46 (53.5)	103 (51.5)	57 (50)	40 (46.5)	97 (48.5)	χ^2=0.239 p=0.625
Dose of ERIG	84 (73.7)	47 (54.7)	131 (65.5)	30 (26.3)	39 (45.3)	69 (34.5)	χ^2=7.858 p=0.005*
Dose of HRIG	87 (76.3)	56 (65.1)	143 (71.5)	27 (23.7)	30 (34.9)	57 (28.5)	χ^2=3.017 p=0.082

*P value <0.05.

Table 9: Logistic regression results for dependent and independent variables.

Independent variables	Dependent variables																	
	Symptoms of rabies			Site of ARV			Route of ARV			Management of category I animal bite			Management of category III animal bite			ERIG dose		
	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value
Gender																		
Female	Reference																	
Male	1.05	0.49-2.23	0.90	1.04	0.44-2.46	0.93	1.06	0.59-1.90	0.85	0.57	0.3-1.1	0.09	0.23	0.06-0.85	0.028*	1.65	0.9-3.0	0.104
Experience in dealing with animal bite cases																		
No	Reference																	
Yes	0.4	0.18-0.85	0.018*	15.96	4.62-55.15	<.001*	1.94	1.07-3.49	0.028*	2.28	1.15-4.50	0.018*	3.1	0.98-9.87	0.055	2.2	1.21-4.0	0.01*

*P value <0.05.

DISCUSSION

In our study, the mean±standard deviation of age was 23.34±0.859 years, similar to the findings of Deori et al (mean=23.4 years) and Chowdhury et al (mean=23.5 years).[5,6] The majority (51.5%) were males, similar to the findings of Kumar et al (56.7%).[7] The majority were Hindus (87%), followed by Buddha (7.5%), which was different from the findings of a study conducted by Giri et al where the majority were Muslims (80.3%), followed by Hindus (18.4%).[4] In the present study, 40% knew the correct incubation period of rabies, which was close to the finding of a study carried out by Tiwari et al (45.9%) but lower than the findings of studies carried out by Giri et al (75%), Deori et al (61.25%) and Sarkar et al (92%).[4,5,8,9] The majority (91.5%) knew that dogs and other warm-blooded animals are reservoirs of infection, which was higher than the findings of studies carried out by Giri et al (73.6%), Sarkar et al (54%) and Shete et al (57%).[4,9,10] Seventy-three percent had correct knowledge regarding the mode of transmission of rabies, which was near the findings of a study carried out by Giri et al (76.4%), but lower than the findings of studies carried out by Sarkar et al (98%) and Mishra et al (95%).[4,9,11] The majority of interns (63.5%) knew that IM/ID is the correct route of ARV; this finding was similar to the finding of Giri et al (68.4%) but higher than the findings of Chowdhury et al (10%), Kumar et al (20%), Tiwari et al (10.4%), and Sarkar et al (35%).[4,6-9] The majority of interns (86%) knew that ARV is not included in the national immunisation schedule; this finding was higher than the finding of Giri et al (71.1%).[4] Seventy-five percent knew the correct schedule of PEP, which was higher than the findings of Tiwari et al (43.7%) but lower than Mishra et al (83%).[8,11] The majority (87%) could correctly classify category I bite which was higher than the findings of Giri et al (77.6%), Sarkar et al (67%), and Shashikantha et al (62%).[4,9,12] Similarly, the majority (86%) could correctly classify category II bite which was higher than the findings of and Giri et al (81.6%), Sarkar et al (19%) and Shashikantha et al (66%).[4,9,12] Also, the majority (84%) could correctly classify category III bite which was lower than the findings of Giri et al (88.1%) but higher than the findings of Sarkar et al (57%) and Shashikantha et al (72%).[4,9,12] Only 26.5% knew the correct management of Cat I animal bite which was higher than the findings of Chowdhury et al (10%).[6] The majority (74.5%) knew the correct management of Cat II animal bite which was higher than the findings of Chowdhury et al (57.5%) and 89% knew the correct management of Cat III animal bite which was near the findings of Chowdhury et al (85%).[6] In this study, it was seen that 51.5% of interns knew correctly that only wound washing and application of antiseptic should be done for wound management of animal bite cases, while 1% of interns believed that suturing should be done along with wound washing and antiseptic application. Also, 1% of interns believed that cauterization should be done along with wound washing and antiseptic application. Both of these findings were almost negligible when compared to the findings of Kumar et al, Sarkar et al, Mishra et al where 23.33%, 34%, 21% of interns, respectively believed that suturing should be done and 17.78%, 28%, 62% of interns, respectively, believed that cauterization should be done.[7,9,11] In this study, it was found that there were statistically significant differences in knowledge regarding the categorization of minor scratches or abrasions without bleeding, management of category III animal bites, wound management and dose of HRIG between male and female interns. In a study done by Giri et al it was found that there were statistically significant differences in knowledge regarding the incubation period of rabies, the site of ARV, inclusion of ARV in NIS and categorization of category I animal bite between male and female interns.[4] In our study, it was found that the mean and standard deviation of the total knowledge score among interns was 13.17±2.63 (minimum=7, maximum=18). Among females, it was 12.9±2.67; among males, it was 13.5±2.57 (p value=0.107). Among interns who had experience in dealing with animal bite case, it was 13.8±2.49, while among interns who had no experience in dealing with animal bite case, it was 12.4±2.63 and this difference was statistically significant with a p value <0.001. Overall, 115 (57.5%) of interns had above-average knowledge regarding rabies (total knowledge score ≥13), while 85 (42.5%) of them had below-average knowledge regarding rabies (total knowledge score <13).

Strength and limitations

The present study is unique as we also tried to study the association between experience in dealing with an animal bite case and intern's knowledge. Limitations of this cross-

sectional study is that the findings are from a single government medical college and a certain group of population i.e. medical interns only and as a small sample size; therefore, the findings cannot be generalized to all interns or other healthcare professionals in the country.

CONCLUSION

The study showed that the mean total knowledge score was significantly higher among interns who had dealt with an animal bite case than among those who hadn't. To some extent, not being able to deal with animal bite cases may be due to the fact that the majority (72%) of study participants were from the 2023 internship batch, who started their rotatory internship schedule in April 2023 and might be posted in different departments during our study period. To increase practical exposure and overall knowledge among interns, there is a need to increase interactive animal bite case-dealing sessions at concerned OPDs. Also, only 40% of interns knew the correct incubation period of rabies, 17% knew all the symptoms of rabies and only 26.5% knew the correct management for category I animal bite. Regular continue medical education (CME) should be conducted to address specific knowledge gaps. Also, information education communication (IEC) materials, such as posters, should be made available and visibly displayed in concerned OPDs.

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