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Assessment of knowledge, attitude and practice of rabies prophylaxis among medical officers of anti-rabies vaccination clinics of Municipal Corporation of Greater Mumbai

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ABSTRACT

Background: We conducted the present study to assess the knowledge, attitude and practice of rabies prophylaxis among medical officers of anti-rabies vaccination clinics of Municipal Corporation of Greater Mumbai (MCGM). **Methods:** We conducted a cross sectional study in 30 ARV clinics of MCGM. We collected data using pretested, structured, self-administered questionnaire and a facility survey check list. Questionnaire included questions pertaining to epidemiology of animal bite, biologicals supplied, protocols and guidelines for rabies prophylaxis, dosage and route of administration of ARV and training status. We analysed data using Microsoft Excel, 2007. Spearman's rank correlation and Friedman test was used to examine the relationship between knowledge, attitude, and practice. The results were presented in the form of rates and ratios appropriately and p≤0.05 was considered statistically significant.

Results: Mean knowledge, attitude and practice score of the study participants was 74.6%, 68.7% and 41% respectively. The difference between knowledge, attitude and practice was statistically significant (p<0.01). Knowledge poorly correlated with attitude (r=0.18) and practice (r=0.13).

Conclusions: In Mumbai ARV clinics are uniformly spread in the community. All the clinics are well equipped and staffed. There was no shortage of vaccine in any centre. Counselling of patients was done in all ARV clinics however there was lack of patient education materials. Knowledge of medical officers in respect of dose, route of administration, site of vaccination and schedule of vaccination of anti-rabies vaccine was good. The knowledge of immunoglobulins was poor. Knowledge poorly correlated with attitude and practice.

Keywords: ARV clinics, KAP study, Post exposure prophylaxis, Rabies, Rabies vaccines

INTRODUCTION

Rabies is an acute viral disease that causes fatal encephalomyelitis in virtually all the warm-blooded animals including man. The virus is found in wild and some domestic animals and is transmitted to other animals and to humans through their saliva. In India, dogs are responsible for about 97% of human rabies, followed by cats (2%), jackals, mongoose and others (1%). The disease is mainly transmitted by the bite of a rabid dog.¹ In India, animal bites in humans are a public health problem and an estimated 20,000 human rabies deaths

and 17.4 million animal bites occur annually.^{2,3} India accounts for 35% of global and 65% of Asian human rabies deaths.⁴

In Mumbai, there are total 414 government health facilities to provide health care to the general population. All these 414 health facilities are under administrative control of Municipal Corporation of Greater Mumbai (MCGM), the local Government. These health facilities include 4 Medical Colleges, 1 Dental College, 16 General Hospitals, 06 Specialty Hospitals, 29 Maternity Homes, 175 Municipal Dispensaries and 183 Health Posts. Out of these listed health facilities, 101 health facilities have ARV clinics. These ARV clinics are located in Medical Colleges, General Hospitals and Municipal Dispensaries. All four Medical Colleges and 16 General hospitals have ARV clinics. However, out of total 175 Municipal Dispensaries have ARV clinics.

The corporation hospitals in Mumbai annually records more than 85,000 animal bite cases.⁶ Timely and correct post exposure prophylaxis for these animal bite victims is essential to prevent rabies. Therefore, attending antirabies clinic Medical Officer (MO) must provide appropriate post exposure prophylaxis (PEP) which includes proper wound management, a full course of antirabies vaccination (ARV), counselling about the dates of vaccination and importance of completing the course of vaccination and local wound infiltration of rabies immunoglobulin (RIG) in category III (severe exposures) to save lives.

We conducted the present study to assess the knowledge, attitude and practice (KAP) of rabies prophylaxis among medical officers of anti-rabies vaccination clinics of MCGM.

Objectives

To assess the knowledge, attitude and practice (KAP) of rabies prophylaxis among medical officer of anti-rabies vaccination clinics of MCGM. To study the correlation between knowledge and attitude, knowledge and practice and attitude and practice of rabies prophylaxis among medical officers of anti-rabies vaccination clinics of MCGM. To assess the facilities available for rabies prophylaxis in hospitals and health centers of MCGM.

METHODS

Study area

We conducted the study in 30 ARV clinics of MCGM during the period January 2020 to July 2020. MCGM has a network of 4 medical college-hospitals, one dental college-hospital, 16 municipal general hospitals, 6 specialty hospitals, 29 maternity homes, 175 municipal dispensaries and 183 health posts.⁵ Out of the above mentioned health facilities, 101 health facilities have

designated ARV clinics and more than 100 medical officers serve in these clinics.

Study design and sampling

We assessed the knowledge, attitude and practice of rabies prophylaxis services among medical officers working in ARV clinics of MCGM. All the health facilities providing ARV services in each group of health facilities were listed in alphabetical order of their given name. Out of these enlisted facilities 30 ARV clinics were selected (Table 1). Inclusion criteria for the clinics and medical officer were that the facility should be providing ARV and the medical officer should be willing to participate in the study. We selected these 30 ARV clinics by Simple Random Sampling technique, keeping the same proportion as the ARV clinics were in each group of health facility. The sample size of 30 was arrived empirically as 30 clinics were considered sufficient to study the stated objectives and draw logical conclusions. We collected data using pretested, structured, selfadministered questionnaire and a facility survey check list

Table 1: Distribution of health facilities providingARV services in MCGM.

Name of the health facility	Total number	Number of facilities with ARV clinics	Facility selected for study
Medical and dental college hospitals	05	04 (03.9%)	01 (03.3%)
General hospitals	16	16 (15.9%)	09 (30.0%)
Municipal dispensaries	175	81 (80.2%)	20 (66.7%)
Total	196	101(100%)	30 (100%)

We assessed the knowledge, attitude and practice of medical officers towards rabies prophylaxis services asking questions pertaining to epidemiology of animal bite, biologicals supplied, protocols and guidelines for rabies prophylaxis, dosage and route of administration of ARV and training status of the responder. The questionnaire comprised of 30 questions; 10 for knowledge, 10 for attitude and 10 for practice assessment. The correct answer was given a score of one and zero otherwise. The maximum attainable score for knowledge, attitude and practice were 10, 10 and 10 respectively. We assessed the facilities for availability of anti-rabies vaccine, cold chain, wound washing facility and patient counselling facility.

Data management and statistical analysis: We analyzed data using Microsoft Excel, 2007. Spearman's rank correlation was computed to measure the relationship between (i) knowledge and attitude, (ii) attitude and practice, and (iii) knowledge and practice. Friedman test (nonparametric) was used to examine the relationship between knowledge, attitude, and practice. The results were presented in the form of rates and ratios appropriately and $p \le 0.05$ was considered statistically significant.

RESULTS

All 101 ARV clinics are evenly distributed across the Mumbai catering services to general population. Out of total 30 medical officers 12 (40%) were male. A total of 8 (26.7%) medical officers reported that they had done post-graduation diploma courses and 5 (16.7%) medical officers reported that they received training on intradermal rabies vaccine (IDRV) administration. None of the medical officers received training on rabies immunoglobulin (RIG) administration (Table 2).

Table 2: Demographic profile and training status of
medical officers (n=30).

Profile		N (%)
Gender	Male	12 (40)
	Female	18 (60)
Qualifications	Graduation degree	22 (73.3)
	Post-graduation degree	08 (26.7)
Received training on IDRV administration		05 (16.7)
Received trainin	00 (0.0)	

Mean knowledge score of the study participants was 74.6% and it ranges from 36.7 to 100%. Mean knowledge score was 100% for ARV dose and the site of vaccination. Mean knowledge score in respect of do's and don'ts of rabies prophylaxis was the least (Table 3).

Table 3: Knowledge on rabies prevention among medical officers (n=30).

Knowledge question	Correct knowledge N (%)
What should not be done with animal bite wound	16 (53.3)
Need for antibody test after anti-rabies vaccination	18 (60)
Single wound with bleeding refers to which category of exposure	22 (73.3)
Can animal bite wounds be cauterized	11 (36.7)
Number of doses of intramuscular anti-rabies vaccine for post exposure prophylaxis	30 (100)
WHO recommendations for pre-exposure prophylaxis (PrEP)	27 (90)
The site for intramuscular administration of anti-rabies vaccine is	30 (100)
What is the dose of anti-rabies vaccine in infants	28 (93.3)
Schedule for intramuscular anti-rabies vaccination for pre-exposure prophylaxis is	24 (80)
What is the dose of equine rabies immunoglobulin (ERIG) in human	18 (18)

Table 4: Attitude of medical officers towards rabies prophylaxis services (n=30).

Attitude	Correct attitude N (%)
Anti-rabies vaccine safe in pregnancy	19 (63.3)
Rabies is transmitted by the bite of squirrels	14 (46.7)
Touching or feeding to animal is cat II exposure	18 (60.0)
Pet dogs do not transmit rabies	26 (86.7)
Observation of animals is applied only for dogs and cats	21 (70.0)
Wound washing with soap and water reduces virus load	24 (80.0)
Anti-rabies vaccine can be given to lactating mothers	24 (80.0)
Anti-rabies vaccine also can be given subcutaneously	29 (96.7)
Anti-rabies vaccine administered through intradermal route is less effective than intramuscular route	18 (60.0)
Rabies immunoglobulins are lifesaving in all cat III bites	13 (43.3)

Mean attitude score was 68.7% and it ranges from 43.3 to 96.7%. Mean attitude score was 96.7% in respect of route of vaccination specifying that the anti-rabies vaccine can be given subcutaneously. Mean attitude score in respect of use of immunoglobulin for lifesaving in all category-III bites cases was the least (Table 4).

Mean practice score of the study participants was 41% and it ranges from 3.3 to 80%. Mean practice score was

maximum i.e. 80% in respect of administering ARV if a patient comes 6 months after the completion of full course of PEP and what to do if orange peel appearance is not seen after intra-dermal vaccination. Mean practice score for how to infiltrate rabies immunoglobulin (RIG) and what to do in case of rat bite was the least (Table 5).

None of the ARV facilities used case record form (CRF) for dog bite cases. However record was maintained in an

animal bite register. Out of 30 ARV clinics, 28 (93.3%) had facility of soap and water for wound washing while none of the facilities provide antiseptic for wound washing. None of the facility had separate room for patient counselling; two clinics had wall posters as patient

education material. Ant-rabies vaccine and refrigerator was available in all facilities. None of the facilities experienced any 'stock out' situation for anti-rabies biologicals (Table 6).

Table 5: Practice of rabies prophylaxis among medical officers (n=30).

Question on practice of rabies prophylaxis	Correct practice N (%)
What will you do if a case of rat bite comes to you	01 (03.3)
What you will do in case of animal bite with severe bleeding which need suturing	08 (26.7)
What you will do when skin sensitivity test is positive for equine rabies immunoglobulin	14 (46.7)
(ERIG)	
How you will infiltrate rabies immunoglobulin (RIG)	01 (03.3)
What will you do, if the calculated dose of RIG is inadequate to infiltrate in all wounds	12 (40.0)
What will you do if the patient comes 7 days after 1 st dose, for 2 nd dose of vaccine	20 (66.7)
What will you do if you don't get orange peel appearance after intra-dermal vaccination	24 (80.0)
What will you do if patient comes 1 week after the dog bite	04 (13.3)
What will you do if a patient comes with re-exposure, 6 months after the completion of full course of post exposure prophylaxis	24 (80.0)
What will you do if 1 dose of reconstituted anti-rabies vaccine is left at the end of vaccination session?	15 (50.0)

Table 6: Facilities for rabies prophylaxis services available in ARV clinics of MCGM (n=30).

Rabies Prophylaxis	Number of facilities N (%)
Rabies case record form (CRF)	00 (0.0)
wound washing facilities	
Only water	28 (93.3)
Soap and water	28 (93.3)
Antiseptic	00 (0.0)
Patient education material (at least one)	02 (6.7)
Separate room for patient counselling	00 (0.0)
Anti-rabies vaccine	30 (100.0)
Cold chain equipment (refrigerator)	30 (100.0)
Ever experienced stock out for anti- rabies biologicals in last 6 months	00 (0.0)
Average number of stock out days (Mean±SD)	00 (0.0)

Table 7: Comparison of knowledge, attitude and practice of medical officers of ARV clinics of MCGM.

	Median	Chi-square*	P value
Knowledge	7		
Attitude	8	19.52	0.0006
Practice	5		

*Friedman test

The knowledge, attitude and practice of medical officers were examined using Friedman test (non parametric test)

to measure the extent of relationship between them. There was a significant difference (p<0.01) between knowledge, attitude and practice among these medical officers (Table 7).

Mean score of knowledge, attitude and practice among male medical officers was 7.2, 8.0 and 5.5 respectively. Mean score of knowledge, attitude and practice among female medical officers was 7.3, 7.2 and 5.7 respectively. There was no difference in the knowledge, attitude and practice of male and female medical officers. Mean score of knowledge, attitude and practice among medical officers possessing graduation degree was 7.3, 7.5 and 5.5 respectively. Mean score of knowledge, attitude and practice among medical officers possessing postgraduation degree was 7.0, 7.6 and 6.0 respectively. There was no difference in the knowledge, attitude and practice of medical officers possessing graduation or post-graduation degree. Mean score of knowledge, attitude and practice among medical officers in General Hospital was 7.2, 8.3 and 5.7 respectively. Mean score of knowledge, attitude and practice among medical officers in municipal dispensaries was 7.3, 7.3 and 5.6 respectively. There was no difference in the knowledge, attitude and practice of medical officers in general hospital and municipal dispensaries. Mean score of knowledge, attitude and practice among medical officers who received training in IDRV was 7.5, 6.3 and 5.8 respectively. Mean score of knowledge, attitude and practice among medical officers who did not receive training IDRV was 7.3, 7.8 and 5.6 respectively. There was no difference in the knowledge, attitude and practice of medical officers in respect of training in IDRV (Table 8).

		Knowledge (Mean±SD)	Attitude (Mean±SD)	Practice (Mean±SD)
Gender	Male (12)	7.2±1.3	8.0±1.4	5.5±1.1
	Female (18)	7.3±1.2	7.2±2.0	5.7±1.4
	P value	0.31	0.12	0.36
Qualification	MBBS (22)	7.3±1.2	7.5±1.9	5.5±1.3
	PG (8)	7.0±1.1	7.6±1.7	6.0±1.2
	P value	0.19	0.43	0.15
Facility type	General hospital (09)	7.2±1.3	8.3±1.4	5.7±1.2
	Dispensary (20)	7.3±1.1	7.3±1.8	5.6±1.3
	P value	0.4	0.07	0.45
Training status	Trained in IDRV (5)	7.5±0.6	6.3±1.9	5.8±1.5
	Not Trained in IDRV (25)	7.3±1.2	7.8±1.7	5.6±1.3
	P value	0.7	0.08	0.8

Table 8: Comparison of knowledge, attitude and practice as per gender, qualification and facility type.

*Medical College was not compared as there was only one unit under this type of facility.

The scores of knowledge and attitude, knowledge and practice, and attitude and practice were compared. The Spearman rank correlation between knowledge and attitude, knowledge and practice and attitude and practice were computed. There was a poor positive linear relationship between knowledge poorly correlated with attitude (r=0.18) and practice (r=0.13) and attitude poorly correlated with practice (r=0.29) (Table 9).

Table 9: Correlation between knowledge, attitude and practice of medical officers of ARV clinics of MCGM.

	Spearman coefficient	P value
Knowledge versus attitude	0.18	0.35
Knowledge versus practice	0.13	0.48
Attitude versus practice	0.29	0.1

DISCUSSION

In Mumbai there are more than 100 government health units to provide the anti-rabies vaccination, approximately one facility per lakh population. These centres are uniformly located among the general population. In addition to these government facilities there are private health units which also provide antirabies services. All ARV clinics had adequate vaccine and cold chain equipment's. All ARV clinics had wound washing facility. In all ARV clinics patients were counselled and importance of PEP was explained. In most of the facilities there was no separate counselling room and also there were no patient education tools like health education material.

The present study showed that the knowledge of medical officers regarding anti-rabies prophylaxis was adequate. All medical officers were aware of the dose, route of

administration and site of administration of ant-rabies vaccine. Knowledge about classification and management of animal bite wound was inadequate. Only 36.7% of them had proper knowledge about the management of animal bite wound; only 73.3% of them knew about the classification of animal bite wound and only 80% knew that proper wound washing with soap and water reduces viral load.

Similar results were shown in a previous study in India conducted by Harish et al.⁷ They found that many respondents have the concept that only big or multiple bite wounds are category-III rabies exposures. In the present study, 93.3% of medical officers had knowledge that the dose of ARV is independent of the age of the victim and severity of the bites (single or multiple). However, it should be made clear that the type of animal (domestic or wild) should determine the number of vaccine injections required.^{8,9}

The knowledge of RIG administration was poor. Only 60.0% of the respondents were aware of the dose of RIG, only 40.0% were of how to infiltrate the RIG and none of the respondents have ever administered RIG. Physicians must be sensitized that RIG must be infiltrated into and around the bite wounds. RIG's ready-made antibodies provide passive immunity and help in saving the patient over the initial phase of the infection. Active immunity induced by anti-rabies vaccine takes up to 10 days for antibodies to appear in circulation.¹⁰

Human rabies immune globulin is virtually unavailable in most rabies endemic countries or it is far too expensive to be used in the public sector. Equine rabies immunoglobulins are now manufactured by several institutes in India, China, Thailand, and South America. They have been tested and approved by their individual government regulators, are relatively inexpensive, and should be used. Total 90.0% of respondents knew the correct schedule for pre-exposure prophylaxis. It is important, especially for children and groups like postman/courier boys, police, in canine rabies endemic regions.¹¹

In view of the scarcity and affordability of vaccines and RIGs, one should advocate pre-exposure vaccination for certain high risk persons. Similarly, only 80.0% of the medical officers understood correct management of previously vaccinated and re-exposed patients. Such re-exposures to animal bites may be as high as 15% in some settings.¹² Individuals with previous rabies vaccination do not need rabies immunoglobulin; only two booster vaccinations with cell-culture vaccine on days 0 and day 3, administered either intramuscularly or intra-dermally, are WHO recommended.¹³ The present study showed that, there is a significant difference between knowledge, attitude, and practice (p<0.001). Animal bite clinic physicians require further and repeated education to change their attitude and motivation.

CONCLUSION

In Mumbai ARV clinics are uniformly located in the community. All the clinics are well equipped and staffed. There was no shortage of vaccine in any centre. Counselling of patients was done in all ARV clinics however there was lack of patient education materials. Knowledge of medical officers in respect of dose, route of administration, site of vaccination and schedule of vaccination of anti-rabies vaccine was good. The knowledge of immunoglobulins was poor. Knowledge poorly correlated with attitude and practice. Very few medical officers were formally trained in anti-rabies prophylaxis and vaccination.

Recommendations

All ARV clinics should be provided with sufficient health education material on rabies prevention and anti-rabies prophylaxis which will be useful for patient counselling.

All medical officers working in ARV clinics shall be trained on rabies prevention and control including vaccination and use of rabies immunoglobulins.

To organize continued medical education (CME) programs, seminars, conferences, workshops, technical films and hands on training on prevention and control of rabies.

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