

**Brief Communication (Original)**

# Knowledge, attitude, and practice of rabies prophylaxis among physicians at Indian animal bite clinics

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**Background:** Animal bites in humans are an important public health problem. Timely and correct postexposure prophylaxis for victims is necessary to prevent deaths.

**Objectives:** We studied the knowledge, attitude, and actual practice of rabies prophylaxis among physicians at animal bite clinics and the relationship between their knowledge and actual practice.

**Methods:** A cross sectional study was conducted among 109 physicians working in eight Indian cities. The data collected were analyzed using SPSS version 16.0. The descriptive statistics were computed. Spearman's rank correlation was computed to measure the relationship between knowledge, attitude and practice.

**Results:** The knowledge, attitude and practice of these anti rabies clinic physicians were inadequate with respect to different parameters. The appropriate life-saving use of immunoglobulins was one of these. The present study also showed that there was a significant difference between knowledge, attitude, and practice.

**Conclusions:** Knowledge, attitude, and practice needs to be improved through properly designed awareness programmes for all physicians dealing with rabies exposures. Emphasis should be on following current WHO guidelines for post exposure prophylaxis of rabies.

**Keywords:** Animal bites, animal bite clinics, medical officers knowledge and practices, rabies prophylaxis, use of immunoglobulins, wound care

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Rabies is a viral zoonosis that occurs in over 100 countries and territories of our world. It 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 [1]. In India, animal bites in humans are a public health problem and an estimated 17.4 million animal bites occur annually [2]. In urban areas, the disease is mainly transmitted by dogs, being responsible for 96% of human animal bite cases [3]. Timely and correct postexposure prophylaxis for these animal bite victims is essential to prevent rabies. Therefore, attending antirabies clinic physicians must provide appropriate postexposure prophylaxis (PEP), which includes proper wound washing, a full course

of antirabies vaccination (ARV) and local wound infiltration of rabies immunoglobulin (RIG) into wounds to save lives. The present study was conducted to assess the knowledge, attitude and actual clinical practice of rabies prophylaxis among animal bite clinic physicians and to study the relationship between knowledge, attitude, and actual practice.

## Materials and methods

A cross sectional study was done to assess the knowledge, attitude and practice on rabies prophylaxis working at animal bite clinics for a minimum of six months in eight cities of India including Bangalore, Belgaum, Chennai, Coimbatore, Guntur, Hubli, Mallapuram, and Mumbai. Data were collected using a pretested, structured, self-administered questionnaire. One hundred and nine physicians working in the eight cities were included in this study. The data collected were analyzed using SPSS version 16.0. Spearman's rank correlation was computed to measure the relationship between (i) knowledge and attitude, (ii) attitude and practice, and (iii) knowledge and practice. A Friedman test

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(nonparametric) was used to examine whether there is any relationship between knowledge, attitude, and practice. The results obtained were considered statistically significant whenever  $p < 0.05$ .

## Results

### Knowledge

We observed that knowledge of rabies prevention was low, especially regarding classification of bite wounds (55.9%), type of animals transmitting rabies (66.9%), correct dose of equine rabies immunoglobulin (ERIG) (66.9%) and preexposure prophylaxis (PrEP) (68.8%). There was relatively good knowledge concerning the burden of disease (75.2%), importance of wound washing (80.7%), number of doses of vaccine (74.4%) and dose–schedule of intra dermal rabies administration (IDRV) (75.2%). Respondents had good knowledge regarding the safety of rabies vaccine in pregnancy (85.3%), dose of vaccine for infants (84.4%) and site of administration of vaccine (83.5%) as shown in **Table 1**.

### Attitude and clinical practice

The present study showed that, the attitude (applying their knowledge to clinical practice) of

animal bite clinic physicians for prophylaxis was less appropriate regarding categorization of wounds (67.8%) and intradermal rabies vaccination (IDRV) (67.8%). The attitude of the respondents towards RIG administration, the type of animals transmitting rabies, observation of suspect animals and route of administration of ARV respectively was 73.4%, 75.3%, 77.9%, and 78.9%. However, the percentage of attitude score towards wound washing (80.7%), vaccine in pregnancy and lactation (85.3%), and pet dog risk of transmission of rabies (92.7%) was quite high (**Table 2**).

The practice in rabies prophylaxis was less with respect to dilution of RIG (57.7%), treatment option for subjects with positive skin sensitivity test to ERIG (66.9%), PEP following late reporting (66.9%), intradermal administration (68.9%), and reexposure vaccination (68.9%). However, the respondents had fairly good practice scores on RIG infiltration of wounds (73.4%) and PEP for unusual animal bites (74.3%). There was a better practice score for physicians regarding suturing of bite wounds (88.9%), and schedules of vaccination (92.6%) (**Table 3**).

**Table 1.** Knowledge of rabies prophylaxis (n = 109)

Knowledge	Correct knowledge	Percentage
Burden of disease	82	75.2
Animals transmitting rabies	73	66.9
Categorization of bite wound	61	55.9
Importance of wound washing	88	80.7
Number of doses of vaccine	81	74.4
ARV in pregnancy	93	85.3
Site of administration of ARV	91	83.5
Dose of ARV in infant	92	84.4
Number of doses of IDRV	82	75.2
Preexposure prophylaxis	75	68.8
Dose of ERIG	73	66.9

**Table 2.** Attitude towards rabies prophylaxis (n = 109)

Attitude	Agree	Percentage
Animals transmitting rabies	82	75.3
Categorization of bite wounds	74	67.8
Pet dog transmission of rabies	101	92.7
Observation of animals	85	77.9
Wound washing	88	80.7
ARV in pregnancy and lactation	93	85.3
Route of administration of ARV	86	78.9
Intradermal rabies vaccination	74	67.8
RIG administration	80	73.4

**Table 3.** Practice of rabies prophylaxis (n = 109)

Practice	Correct practice	Percentage
PEP for other animal bites	81	74.3
Suturing of bite wounds	97	88.9
Treatment option for positive sensitivity test	73	66.9
Site of RIG infiltration	80	73.4
Dilution of RIGs	63	57.7
Schedule of ARV	101	92.6
Proper administration of IDRV	75	68.9
PEP following delayed reporting	73	66.9
Reexposure vaccination	75	68.9

**Comparison of knowledge, attitude, and practice**

The knowledge, attitude, and actual practice of these medical officers was examined using a Friedman test (nonparametric) to measure the extent of relationship between them (**Table 4**). The present study showed that, there was a significant difference between knowledge, attitude, and practice ( $p < 0.001$ ) among these physicians.

**Table 4.** Comparison of knowledge, attitude, and practice

Variable	Median	Chi*	p
Knowledge	9	116.234	<0.001
Attitude	11		
Practice	7		

\*Friedman test

**Spearman rank correlation**

The scores of knowledge and attitude, knowledge and practice, and attitude and practice were plotted on a scatter diagram as shown below in **Figures 1-3** respectively. The Spearman rank correlation between knowledge and attitude, knowledge and practice, and attitude and practice was computed. There was a moderate positive linear relationship between knowledge and attitude ( $r = 0.667$ ,  $p < 0.001$ ), poor positive linear relationship ( $r = 0.220$ ) between knowledge and practice, and poor positive linear relationship between attitude and practice ( $r = 0.334$ ).

**Discussion**

In rabies endemic countries, animal bites are very common. Early and correct management of animal bite wounds is essential for prevention of rabies, which includes proper wound washing, infiltration of rabies

immunoglobulin in and around the wound, and a full course of antirabies vaccination. This has to be provided by physicians in a timely manner. The present study showed that the knowledge of clinical physicians regarding anti rabies prophylaxis was inadequate. Only 55.9% of them knew about proper risk classification of wounds. Similar results were shown in a previous study in India conducted by Harish et al. [4]. They found that many respondents have the concept that only big or multiple bite wounds are category III rabies exposures. Responsible physicians must follow World Health Organization (WHO) recommendations for categorization of bite wounds before ordering PEP. The requirement for prompt and thorough wound washing was only recognized by 80.7% of respondents. The WHO Expert Committee emphasizes the importance of prompt local treatment of all bite wounds and scratches that may be contaminated with rabies virus, even if the person presents after delay [5]. In this study, only 74.4% of physicians had correct knowledge concerning the number of doses of ARV, which are 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 [6]. Similarly, the present study showed that only 75.2% of responders knew the proper intradermal rabies vaccine dose/schedules. IDRV has been established as an efficacious and economic alternative to the standard intramuscular schedules [7]. Using vaccines explicitly authorized for the intradermal route and their proper delivery requires sufficient training to ensure their correct storage, reconstitution, and injection. This knowledge of RIG administration was seen in only 66.9% of the respondents. Physicians must understand



Figure 1. Spearman rank correlation between 'knowledge' and 'attitude'

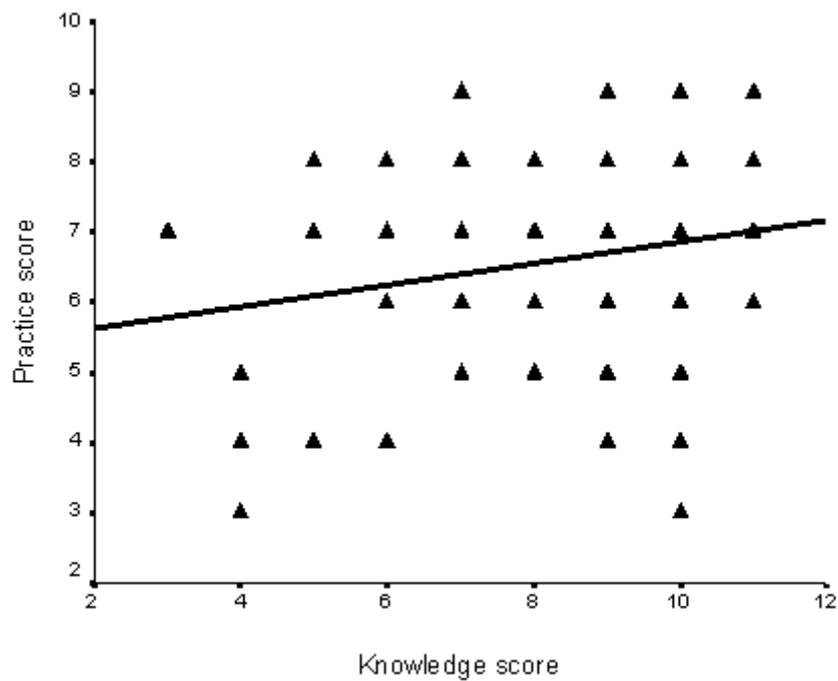


Figure 2. Spearman rank correlation between 'knowledge' and 'practice'

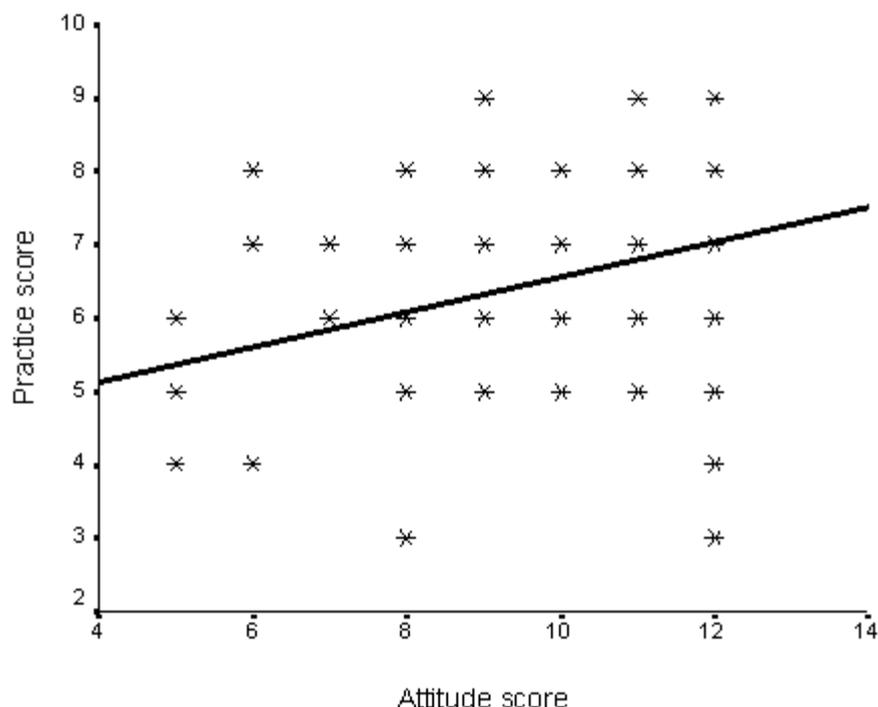


Figure 3. Spearman rank correlation between ‘attitude’ and ‘practice’

that RIG must be infiltrated into and around the bite wounds. RIG’s ready-made antibodies provide passive immunity and help in tiding the patient over the initial phase of the infection. Active immunity induced by antirabies vaccine takes up to 10 days to appear in circulation [8]. 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 [9].

Only 68.8% of respondents knew the correct schedule for preexposure prophylaxis. It is important, especially for children and high risk groups like postman/courier boys, police, in canine rabies endemic regions [10]. In view of the scarcity and affordability of vaccines and RIGs, one should advocate preexposure vaccination for certain high risk persons.

Similarly, only 68.9% of the ARC physicians understood correct management of previously vaccinated and reexposed patients. Such reexposures to animal bites may be as high as 15% in some settings [11]. 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 intradermally, are WHO recommended [12]. 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

Knowledge and actual practice in rabies prophylaxis differ in practice and are not adequate even among animal bite clinic physicians. It has been shown that knowledge is not always applied to actual practice, thus risking lives.

Efforts to correct this dangerous situation must focus on better understanding of animals transmitting rabies, WHO categorization of bite wounds, principles of animal bite management, intradermal use of vaccination to save costs, dosage and correct use of RIG, management of reexposed patients and preexposure prophylaxis where indicated. This can be done through continued medical education (CME) programs, seminars, conferences, workshops, technical films, hands on training, etc. Physicians should understand and follow WHO guidelines and we must work towards bringing about uniformity in pre- and postexposure rabies management.

The authors have no conflict of interest to declare.

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