

## Original Research Article

# Knowledge regarding rabies among school children in an urban area of Kancheepuram district: a cross sectional study

Angeline Grace G.\*, Gopalakrishnan S., Shanthi Edward

Department of Community Medicine, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India

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### \*Correspondence:

Dr. Angeline Grace G.,

E-mail: [christoangeline@yahoo.com](mailto:christoangeline@yahoo.com)

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## ABSTRACT

**Background:** Out of ten people who die due to rabies, four of them are children. Awareness regarding the disease is important to bring down the rabies mortality among children. This study was planned to assess the knowledge regarding rabies among high school students in an urban area of Kancheepuram district.

**Methods:** This study was a school based cross sectional study done in chrompet, an urban area in Kancheepuram district. All students studying in IX and X standards in a school chosen by simple random sampling method were included in the study. Sample size of 335 was calculated using the formula  $4pq/l^2$  and adjusting for 10% non-response. Data was collected using a pre-tested, structured questionnaire and analysed using SPSS version 22.0. Knowledge score of >50% was taken as “adequate knowledge”.

**Results:** Out of the total 340 respondents, 189 (55.6%) were girls and 151 (44.4%) were boys. Around 23.5% reported having pets at home. Though 97.6% of children were aware that dog is an important reservoir of rabies, only 46% knew that the disease is caused by a virus. About 25.6% had knowledge about other reservoirs of rabies. About 72% knew about prevention through anti-rabies vaccine but only 31.5% were aware of the vaccine availability in government hospitals. Overall adequate knowledge on rabies was noted in 46.2% of respondents.

**Conclusions:** Children's understanding on the cause of rabies, prevention and control of rabies was inadequate. Health education activities need to be promoted for the school students to improve their level of awareness on rabies.

**Keywords:** Awareness, Dog bite, Students

## INTRODUCTION

Rabies is a deadly zoonotic disease and an estimated 59000 deaths occur due to rabies in more than 150 countries. Around 95% of the cases are reported in Asian and African countries.<sup>1</sup> Rabies is caused by an RNA virus from the genus *Lyssavirus* and family *Rhabdoviridae*.

The main reservoir for the disease is dogs and other reservoirs which also can cause rabies are cats, monkeys, rodents, bats and wild animals. The disease is transmitted through animal bite where there is a contact between the virus loaded saliva and broken skin.<sup>2</sup> Countries like Canada, Japan, United States of America have eliminated

dog mediated rabies; whereas, rabies is endemic in many developing countries including India.<sup>1</sup> Though the mortality is very high, the disease is totally preventable with prompt post exposure measures including immediate wound wash and prophylaxis with anti-rabies vaccine.<sup>3</sup> World Rabies Day is observed on 28th September every year to increase the awareness about rabies prevention in the community. This day also marks the death anniversary of Louis Pasteur, the French Microbiologist who discovered the first anti-rabies vaccine.<sup>4</sup> It is estimated that 20000 deaths occur every year due to rabies in India alone. Among the Asian countries, India ranks first on the mortality (60%) due to rabies and contributes to 35% of rabies deaths globally.<sup>5</sup>

In India, the incidence of rabies is constant for over a decade and this situation is due to poor knowledge on the disease especially the post exposure prophylaxis, poor status of dog vaccination and uncontrolled canine population.<sup>5</sup> Most of the animal bites reported in India are by dogs (91.5%) out of which 60% are stray dogs.<sup>6</sup>

Although all age groups are susceptible, rabies is more common in children aged less than 15 years.<sup>6</sup> Almost 40% of deaths due to rabies are among children and the case fatality is almost 100% in rabies. Children may not report the bite due to fear of getting scolded by parents or due to lack of awareness about the consequences.<sup>7</sup> Following an animal bite, prevention of rabies relies on quick first aid measures and post exposure vaccination. If preventive measures are not taken, there are high chances of development of rabies disease and subsequent mortality.<sup>8</sup>

Studies have been done among the community in different settings to understand their knowledge regarding rabies in India. Similar studies among school children are very limited and the assessment of their basic knowledge on rabies is essential to have a baseline information. Though an effective vaccine is available, the mortality due to rabies is high because of the poor awareness on the cause of disease, how it gets transmitted and how the disease can be prevented after an animal bite.<sup>1</sup> Children are a high risk group for animal bites and there is a need to target them to understand their awareness on rabies.<sup>6</sup> Hence this study was done to determine the knowledge regarding cause, transmission and prevention of rabies among high school students in an urban area of Kancheepuram district.

## METHODS

This cross sectional study was done in Chrompet, an urban residential area in Kancheepuram district. Chromepet comes under Tambaram taluk, which has a total urban population of 3,56,322 according to 2011 census. Literacy rate is nearly 83% and sex ratio is 976 females for 1000 males.<sup>9</sup> Study population included students in the age group of 13-15 years, studying in IX and X standards in the selected school and those who were willing to participate in the study. The study was done between October and November 2019.

### *Sample size and sampling technique*

In the reference study, 74.3% of children knew about the anti-rabies vaccine for humans. Using formula  $4pq/l^2$  ( $p=74.3$ ,  $q=25.7$ ,  $l=5$ ) the sample size was calculated to be 305. After adjusting for 10% non-response, sample size for the study was 335 children.<sup>10</sup> Among the 16 schools in Chrompet as listed by the Directorate of Education, one school was selected by simple random sampling. In the selected school, all students studying in IX and X standards were included.

Permission was obtained from Head of the Institution before initiation of study. Written informed consent was obtained from parents who were willing to permit their children to participate in the study. Written assent was obtained from willing children after explaining in detail the purpose of the study. With parental consent, students who were willing to participate in the study were included. Students whose parents didn't give their consent and students who were continuously absent during the days of data collection were excluded from the study.

### *Data collection*

Data was collected from the children using a pre-tested, structured questionnaire which was interviewer administered. Socio demographic information of the children was collected. Their knowledge on how rabies is caused, animal reservoirs, first aid measures, prevention through vaccines for humans and vaccination for dogs was assessed. Children were enquired whether they were aware of vaccine availability in government hospitals for free of cost. They were also asked if they had any pet animals at home. Their overall knowledge regarding rabies was recorded for a total score of 10. Children with score  $>50\%$  were considered as having "adequate knowledge" on rabies.

### *Statistical analysis*

Data was entered in Microsoft excel and analysed using SPSS software, version 22. Statistical analysis of the data was done using descriptive and analytical statistics. Descriptive statistics analyzed were presented as frequency distribution and percentage. Analytical statistics for categorical data used were Odds Ratio (OR), 95% Confidence Interval (CI) and p value.

## RESULTS

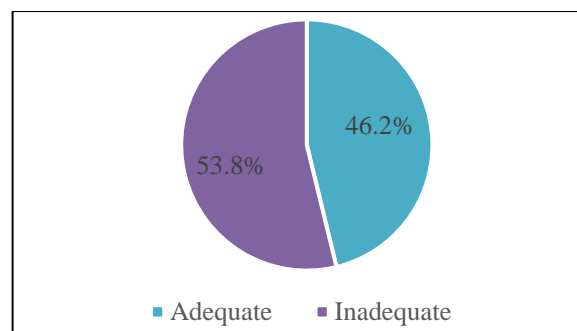
A total of 340 school children were included in the study. Their socio-demographic characteristics and knowledge regarding rabies are presented below.

### *Socio-demographic characteristics of the study population*

Among the total of 340 children, 47% were aged 13 years, 26.8% aged 14 years and 26.2% aged 15 years. Female children constituted a total of 55.6% of the study population. Majority of the children (80%) belonged to Hindu religion. Socio economic class was categorized using Modified Kuppuswamy scale (February 2019). Nearly 33% of children were in upper middle socio economic class, 31.8% in upper class, 27.4% in lower middle class and 7.9% in upper lower class. About 23.5% of children had pet animals in their houses.

**Table 1: Knowledge regarding cause, transmission and prevention of rabies among the study population (n=340).**

Knowledge	Frequency	Percentage
<b>Knows that rabies is caused by virus</b>		
Yes	156	45.9
No	184	54.1
<b>Knows that dog is an important reservoir of rabies</b>		
Yes	332	97.6
No	8	2.4
<b>Knows about other reservoirs of rabies</b>		
Two or more	38	11.2
One	49	14.4
Zero	253	74.4
<b>Knows that rabies is a fatal disease</b>		
Yes	270	79.4
No	70	20.6
<b>Knows that rabies can be prevented by giving vaccines</b>		
Yes	246	72.4
No	94	27.6
<b>Knows that rabies vaccine is available in government hospitals free of cost</b>		
Yes	107	31.5
No	233	68.5
<b>Knows that washing the bite wound is an important first aid measure</b>		
Yes	273	80.3
No	67	19.7
<b>Knows that immediate treatment is needed for dog bite</b>		
Yes	150	44.1
No	190	55.9
<b>Knows that vaccinating dogs can protect from rabies</b>		
Yes	172	50.6
No	168	49.4



**Figure1: Overall knowledge of the study participants regarding rabies (n=340).**

### Knowledge of the children regarding rabies

The knowledge of the school children regarding the cause, transmission and prevention of rabies is presented in Table 1.

About 46% of the children knew that rabies disease is caused by a virus. The scoring of the overall knowledge was done and the knowledge of the children on rabies was classified as adequate and inadequate (Figure 1). About 46.2% of children had adequate knowledge regarding rabies.

### Factors associated with knowledge on rabies among school children

The association between children's socio-demographic factors and their knowledge on rabies was analysed and presented in Table 2.

The odds of having adequate knowledge on rabies was 6.5 times more among children who had pet animals at home compared to children who didn't have any pet animal at home. Other factors didn't show a statistically significant association with adequate knowledge on rabies.

**Table 2: Factors associated with adequate knowledge on rabies among school students (n=340).**

Factors	Adequate knowledge (n)	Inadequate knowledge (n)	OR (95% CI)	P value
<b>Sex</b>				
Male	71	80	1.06 (0.69-1.63)	0.86
Female	86	103		
<b>Socio economic class</b>				
Upper class	50	58	1.01 (0.62-1.63)	0.97
Upper middle and below	107	125		
<b>Owning pet animals</b>				
Yes	63	17	6.54 (3.62-11.83)	<0.001*
No	94	166		

OR: Odds Ratio, CI: Confidence Interval, \*p value<0.05 significant at 95% CI.

## DISCUSSION

This study conducted among 340 school children studying in a private school in Kancheepuram district

showed their knowledge on transmission and prevention of rabies. The results are compared with similar studies done in different settings and are discussed below. In this study, about 46% of the children knew that rabies disease

is caused by a virus. In a similar study by Kanda et al among children in Srilanka, authors noted that 29% of children had the knowledge on cause of rabies.<sup>11</sup> In the present study, nearly 98% of the children knew that dogs are important reservoirs of rabies virus. Sancheti et al in their study among school children in Maharashtra, India reported that 85.7% of them knew that dog bite can potentially lead to rabies.<sup>10</sup> Kanda et al in a similar study in Srilanka, noted that 74.4% of children were able to identify dogs as the main sources of infection.<sup>11</sup> In a study done among children in Nigeria by Asabu et al, authors noted that 65.7% of the children knew that dog bite is an important mode of transmission.<sup>12</sup>

In this study, about 75% didn't have knowledge on other reservoirs of rabies like cats, monkeys, bats, wild animals and rodents. In a similar study in Srilanka, 58.4% and 33.6% of children had knowledge on other reservoirs like cats and bats respectively.<sup>11</sup> Among the study participants, about 23.5% of children had pet animals at home. In the study by Sancheti et al, nearly 30.7% of children had dogs or cats as pets in their households.<sup>10</sup> In the study by Asabu et al, 26.6% of children had pet dogs at home.<sup>12</sup>

Kanda et al in their study reported that only 49% of the children had knowledge on the fatality of rabies.<sup>11</sup> In the present study, nearly 80% of children were aware that rabies is a fatal disease. This looks promising as more children are aware about the severity of the disease. In our study, about 72.4% of the study population had the knowledge that rabies can be prevented by giving vaccines. Whereas in the study by Sancheti et al, 85% of participants were aware of rabies prevention through rabies vaccine.<sup>10</sup> The availability of free anti-rabies vaccines at government hospitals was known to only 32% of children in our study. This information need to be communicated and reinforced in the schools and in the community as many can't afford to take vaccines in private hospitals. Proper health education can improve the utilisation of health services available for the people in government sector.

Among our study population, the knowledge on the first aid measures following animal bite was noted in 80.3% of children. Kanda et al in a similar study done among children in Srilanka, reported that 61.6% of them had knowledge on the first aid measures.<sup>11</sup> Among our study participants, the fact that vaccinating dogs is an important step to prevent rabies was known to only 50.6% of the children. In the study by Kanda et al, this knowledge was noted in only 26% of the school children.<sup>11</sup> Vaccinating dogs is one of the best methods of rabies prevention and this message need to spread in the community especially the pet owners. Initiatives also have to be taken by the local authorities on vaccination of stray dogs.

Overall in this study, about 46% of children had adequate knowledge regarding rabies. This is definitely low and the knowledge can be enhanced only through regular health

education activities in schools and communities. Among the study participants, children who had pet animals in their households had better knowledge on rabies.

Similar finding was noted in a study by Kanda et al where dog owners were found to be more knowledgeable compared to others ( $p=0.01$ ).<sup>11</sup> Other factors such as sex and socio economic class didn't show a statistically significant association with adequate knowledge on rabies.

### Limitations

This study was done among children who were studying in a private school. Their level of knowledge would be different from children studying in government schools. Due to logistic constraints, study was conducted only among high school students in a selected school. It could have been better if more schools were included in the study. Vaccination status of the pet dogs at households was not collected in the study.

### CONCLUSION

The present study among school children in Kancheepuram district showed that the knowledge on the cause, transmission, sources and control of rabies is inadequate among high school students included in the study. Though most of them are aware that dog is an important source of rabies infection, knowledge about the cause, other potential sources and vaccination for dogs was lacking. Adequate knowledge on rabies was seen more among children who had pet animals at home. Health education activities need to be planned and implemented in schools regularly to make the children aware of rabies disease.

### Recommendations

Schools are the best places to target children for health education. With the help of teachers, children can be taught on the prevention and management of animal bite, especially dog bite which is relatively more common. The fact that such animal bite incidents should be immediately reported by the children to either their parents or teachers need to be reiterated. The school curriculum should also include developing awareness about rabies among students. Through sustainable and effective health education, we can increase the awareness levels on rabies among children and thereby bring down the mortality due to rabies.

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