Original Research Article

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Clinico-epidemiological study of human rabies cases attending epidemic disease hospital Mysore city, Karnataka, India

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ABSTRACT

Background: Rabies is the 10th biggest cause of death due to infectious diseases worldwide. It is estimated that 2.5 billion people across 100 countries are at risk of contracting rabies. India reports 20,000 human rabies deaths annually which constitutes one third of global mortalities pertaining to the disease.

Methods: Retrospective 15 years case record analysis was undertaken at Epidemic Disease hospital, Mysore. All the records of human rabies cases reported to the hospital from January 1999 to December 2013 were analyzed. Details regarding socio-demographic characteristics, exposure, post exposure prophylaxis, incubation period, duration of survival were collected in a structured proforma.

Results: Among 100 human rabies reported in fifteen years, majority 76 (76.0%) were above the age of 14 years, 83 (83%) were males, 61 (61%) were belonging to lower socio economic status. Exposure to dogs was noted among 95 (95%) cases. Only 12 (12%) victims had washed the wound with soap and water, 41 (41%) had received antirabies vaccine of whom only 06 (14.6%) received full course.

Conclusions: Majority of human rabies cases observed in the present study was among adults. Dog was the chief reservoir of infection. Poor post exposure prophylaxis was an important factor responsible for rabies.

Keywords: Rabies, Epidemic Disease, Retrospective, Dog bite

INTRODUCTION

Rabies is the 10th biggest cause of death due to infectious diseases across the world. 2.5 billion People residing across 100 countries are at risk of contracting this disease. Every year, 50,000-60,000 human rabies deaths occur across the world, of which majority are from tropical and developing countries. Annually 20,000 human rabies deaths (more than 1/3rd of global burden) are reported alone from India with burden of animal bite cases as high as 1.7 million.²

Asian countries like Thailand, Philippines and Sri Lanka, due to their consorted efforts pertaining to human and animal rabies prevention have successfully brought down the burden this disease. On the other hand India, Pakistan and Bangladesh due to their lack in adapting human and animal rabies prevention strategies, failure of collaborative efforts between medical and veterinary fraternities and lower level of awareness regarding the fatal nature of the disease among general public in these countries are contributing larger number of rabies cases.³ Per capita expenditure due to rabies in Asian countries is as high as 563 million USD.⁴

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In Indian context, rural –poor people are the major victims of rabies. Considerable risk of rabies among these populations is due to not being aware of the serious nature of disease, common myths and misconceptions related to treatment of animal bite wound, inaccessibility to health care centers and non-availability of rabies biologicals at affordable costs. ^{5,6} Policy related matters like, lack of political and administrative commitment, rabies not being included in the list of notifiable diseases, absence of a specific national health programme pertaining rabies are also the factors responsible for the larger burden of disease in India. ⁷

There are various attempts to study the burden of rabies in India and worldwide. The most appropriate estimate of the disease can be obtained through household surveys. On the other hand, extended community surveys which are initiated at hospital and extended to the community can also be adopted.³ Various mathematical models, prediction techniques⁸ and Global positioning systems⁹ are also being used. Nevertheless, hospital case record analysis has its own advantages in assessing clinicoepidemiological aspects of rabies.

In this background the current study was under taken to assess the epidemiological, clinical and precipitating factors of human rabies at Epidemic disease (ED) Hospital, Mysore.

METHODS

Retrospective fifteen years case record analysis was undertaken at Epidemic Disease hospital, Mysore for a period of six months. All the case records of human rabies cases reported to the hospital from January 1999 to December 2013 were analyzed. Details regarding sociodemographic characteristics, history of exposure to dog/animals bites/contact, post exposure prophylaxis including wound wash, administration of antirabies vaccination, immunonoglobulin, symptoms of rabies, incubation period, duration of survival were collected in a pre-tested structured proforma by referring to the case sheets. Socio economic status was assessed using Modified B. G. Prasad Classification considering per capita monthly income as mentioned in the hospital records. The monthly income was multiplied with the correction factor derived from All India Consumer Price Index (AICPI) for the specific years to arrive at the specific cut offs of income to classify the families. ¹⁰ The missing information was gathered through the telephonic conversation with the relatives/family members of rabies victims wherever feasible.

Statistical analysis

Data collected was entered and analyzed using MS-EXCEL version 2010. Descriptive statistical measures like percentage, mean, median and standard deviations were applied. The data was represented as tables and graphs as relevant.

RESULTS

Among 100 human rabies reported in fifteen years (January 1999- December 2013), majority 76 (76.0%) were above the age of 14 years, 83 (83.0%) were males. 54 (54.0%) were illiterates/ just literates. 46 (46.0%) were laborers by occupation and 61 (61.0%) were belonging to lower socio economic status as per modified B G Prasad's classification and 65 (65.0%) were from rural areas. 95 (95%) of rabies victims were bitten by dog of which majority (82.1%) were stray dog bites. 58 (58.0%) of bites were in the lower limbs.

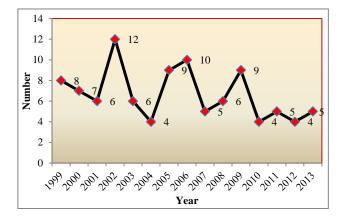


Figure 1: Trend of rabies cases in fifteen years.

Table 1: Age and sex distribution of study subjects.

Character	Number	Percentage
Age (years)		
≤14	24	24.0
>14	76	76.0
Sex		
Male	83	83.0
Female	17	17.0
Education		
Illiterate	54	54.0
Literates	46	46.0
Occupation		
Business	05	05.0
Agriculture	14	14.0
Laborer	46	46.0
Housewife	09	09.0
NA	26	26.0
Socio economic status		
Lower Middle	08	08.0
Upper lower	31	31.0
Lower	61	61.0

Among rabies cases studied, only 12 (12.0%) had washed the wound with soap and water, 26 (26.0%) had applied lime / mud / turmeric powder / jackfruit gum to the site of wound and 62 (62.0%) did not practice any first aid. Only 41 (41.0%) of rabies victims had received antirabies

vaccine following animal bite of whom only 06 (14.6%) received full course of vaccination (NTV before 2005 and cell culture vaccines after that). Among 35 subjects who received incomplete vaccination, 24 (68.6%) received a single dose of vaccine (applies to the recipients of NTV and cell culture vaccines). The mean interval between animal bite/exposure and first dose of vaccination was 45.6 ± 3.2 hours. None of the subjects received rabies immunoglobulin.

Table 2: Distribution of study subjects based on their animal bite/exposure.

Details	Number	Percentage	
Biting animal			
Dog	95	95.0	
Cat	02	02.0	
Cheetah	01	01.0	
Fox	01	01.0	
Wolf	01	01.0	
Category of dog (n=95)			
Pet	17	17.9	
Stray	78	82.1	
Status of the animals			
Died	58	58.0	
Unknown	42	42.0	
Site of bite/exposure (Multiple sites)			
Head and neck	06	06.0	
Trunk	12	12.0	
Upper limbs	33	33.0	
Lower limbs	58	58.0	

Table 3: Distribution of study subjects based on post exposure prophylaxis.

Detail	Number	Percentage		
First aid following animal bite				
Wound wash with soap and water	12	12.0		
Application of mud / lime / turmeric powder / jackfruit gum	26	26.0		
Did not do anything	62	62.0		
Antirabies vaccination				
Received ARV	41	41.0		
Did not receive ARV	59	59.0		
Completeness of vaccination (n=41)				
Complete course	06	14.6		
Incomplete course	35	85.4		

Median incubation period (interval between bite/exposure and first clinical sign/symptom of rabies) was found to be 60 days (RANGE =Seven days to three years). Commonest clinical symptom of rabies was found to be hydrophobia 98 (98.0%). Median duration of survival after onset of clinical symptoms was four days (RANGE = 1 day to 8 days).

DISCUSSION

Rabies being a cent percent fatal but equally preventable scourge, prevention seems to be the vital and the only available strategy. Among various studies conducted across the world, most common factors responsible for the condition were either no or no timely first aid, no/inadequate antirabies vaccination, non-administration of rabies immunoglobulin, indulging in irrational, unscientific magico-religious practices etc. Current study also brings out similar findings and further strengthens concept of poor post exposure prophylactic measures being responsible for high burden of rabies deaths.

In the present study, majority of cases were age above 14 years (76%) and 24% were children below the age of 14 years and a male preponderance in the rabies deaths. Similar observations were made by Sudarshan MK et al. in National Multicentre Epidemiological survey where majority of rabies victims were above the age of 14 years and marginally higher proportion (38.3%) were children and 71% were males.² Wilson Suraweera et al. in their nationally representative rabies mortality survey in India observed equal number of deaths among children and adults with male proportion of 62%. Singh et al. observed that, 55.4% of rabies deaths in and around Delhi were pertaining to adults and 78% among males.⁵ The higher burden of the disease among males and adults may be attributed to their higher chances of getting exposed to the animals. The marginally higher incidence among children is equally a matter of concern which calls for measures to prevent child-animal contact. This in concordance with the observations by Singh et al. in and around Delhi.13

The results of current study pertaining to rural preponderance of cases, belonging to lower socioeconomic strata, illiterates, and laborers were in similar lines with the observations of Sudarshan et al, Wilson Suraweera et al, Singh J et al.and Icchpujani et al.^{2,4,13,14} These socio-demographic characteristics are indicative of poor availability, accessibility, affordability and utilization of antirabies health care services being responsible for rabies deaths.

In the present study, 95% of rabies cases were due to dog bites this observation supports the results of Sudarshan et al, Wilson Suraweera et al and Singh et al, where dog was incriminated to be the animal responsible for transmission of rabies. ^{2,4,5} All these studies also support the observation of present study that the majority of dogs were stray dogs. These observations clearly point towards the need for one health concept which states that human and canine rabies prevention strategies should run hand in hand for successful rabies control.

Post exposure prophylaxis being a crucial step towards rabies prevention, present study brings about the fact that following a dog/animal bite only 12% victims had

washed the wound with soap and water, 41 (41.0%) received antirabies vaccine, of whom only 06 (14.6%) received full course of vaccination and none of them received rabies immunoglobulin. Sudarshan et al observed that, majority of victims (79.1%) had not received any rabies vaccine.2 A small proportion that had received rabies vaccine did not complete the full course. The use of RIGs was negligible. These findings reaffirms that there is lack of awareness and seriousness among people regarding the disease of rabies as well as consequences of inadequate and improper post exposure prophylaxis. Similar findings were also observed by Ichhpujani et al. in their multicentric study on epidemiology of animal bites in India and Shankaraiah et al in Bangalore. 14,15 Looking through the other dimension, the disease also lacks the attention of the government health authorities it actually deserves. Lack of commitment towards rabies prevention, nonavailability of antirabies vaccines and immunoglobulins in government hospitals further adds to the trouble. It was also disturbing to note that more than half victims ended up in irrational, non-convincing, traditional magicoreligious practices. An educational intervention and active case finding and post exposure prophylaxis can increase the acceptability antirabies vaccines and immuniglogulins as noted in a study by Masthi et al and Kulkarni et al. on one health experiment where, with active educational intervention, there was 91.5% of animal bite victims received ARV. 16,17

Median incubation period of rabies was found to be 60 days in the present study it is same as the observations of Sudarshan et al, In another study based on case record analysis in an Infectious Diseases hospital in Delhi, India, 63% of the cases the incubation period was about one to three months.^{2,5} Similar study from the city of Bangalore, India, revealed that in nearly 95% of cases the incubation period was less than six months.⁶

CONCLUSION

The current study which has analysed the case records of human rabies victims over one and a half decade has brought out disappointing fact that, there is a very little change in the practices related to first aid, antirabies vaccination, administration of rabies immunoglobulin etc, which clearly shows where we stand in the mission of human rabies prevention and control. Present study strongly recommends need for a comprehensive rabies prevention strategy which should efficiently addresses public awareness on rabies and its prevention, uninterrupted availability of human rabies biologicals at public health institutions, equal importance for animal rabies prevention and essentially based on the principles of one health.¹⁸

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Institutional Ethics Committee

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