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Research Article

An Epidemiological Study on Knowledge and Practice Regarding Japanese Encephalitis in a Rural Area with Recent JE/AES Outbreak

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Abstract

Introduction: Japanese encephalitis is a major public health problem in recent time in India. Currently there was an outbreak of acute encephalitis syndrome including Japanese encephalitis in northern districts of West Bengal, 60 people have died in July, 2014 where as only five deaths occurred in last year (2013) due to same. In this perspective we conducted the study to assess knowledge and practice regarding Japanese encephalitis among the villagers and to find out association between socio-demographic characteristics and knowledge-practice of the study population if any.

Methodology: A cross-sectional community based observational study was conducted in Dhulagaon, Falakata and Alipurduar district, West Bengal. 460 households were selected by simple random sampling and interviewed with predesigned pretested schedule. Data analysis was done in Microsoft excel 2010.

Results: Overall mean of 17.35±0.35 (out of 32) and 12.27±0.14 (out of 24) were observed for knowledge and practice respectively regarding prevention and control of Japanese encephalitis. Only 13.04% respondents had good knowledge (score≥75%) and only 1.3% had good practice (score≥75%). Socio-demographically the Hindu (33.46%), SC-ST population (37.62%), social class IV & V (34.83%), age group more than 30 years (41.98%), education less than class VIII (40%) had significantly high proportion of poor knowledge ($p<0.05$) while the Hindu (40.23%), SC-ST population (41.58%), educated more than class VIII (40.52%) have significantly high proportion of poor practice ($p<0.05$).

Conclusion: Low level of satisfactory knowledge and practice was identified among the study population. This study thus suggests that, health promotion and availability of preventive services & control measures should be improved by the authority and to give special attention to the population.

Keywords: AES/JE; Knowledge; Practice

Introduction

Japanese encephalitis virus is a leading cause of viral encephalitis in Asia and occurs almost in all Asian countries covering more than three billion population [1,2]. An estimated fifty thousand cases of JE occur globally each year with ten thousand deaths and nearly fifteen thousand disabilities which is a leading cause of viral encephalitis in Asia and occur in almost all Asian countries with recent increasing incidence reported from Bangladesh, India, Nepal, Pakistan, northern Thailand and Vietnam [3]. JE is endemic in fourteen states of India and about thirty core populations are at risk [4]. Assam, Bihar, Haryana, UP, Karnataka and Tamilnadu report outbreaks every year and contribute about 80% of cases and deaths [4] (Table 1). The case fatality rate varies between 20-40%, but it may reach 58% and over [5]. Reported cases of JE and deaths due to it in India and West Bengal 2009-11 are following [6]. Japanese encephalitis is a grave public health problem during last few years in India due to its complex eco-epidemiology and posing serious challenge to its prevention and control [7-10]. The Japanese encephalitis is a zoonotic disease caused by a group B arbovirus (Flavivirus). Control of vector and amplifier hosts is important to reduce the proliferation of Japanese encephalitis virus. Insecticides and pesticides were initially used to kill the larvae of mosquito from the rice field but it required multiple rounds of spraying of pesticide in one season which was not usually done. It may be responsible for the development of insecticide resistance [11]. Alternating irrigation of rice field also reduce vector breeding [12]. Use of protective mosquito nets and repellents are also valuable protective tools for the encephalitis. Amplifier hosts (i.e. pigs) grown in piggeries should be at safe distance from human habitats for disease control purposes. Immunization against Japanese encephalitis of the pigs and birds is another useful step to eradicate it from the environment. Preventive measures which provide in-door facility to animals will be helpful in protection from mosquitoes [13].

Objectives

- To assess the knowledge and practice regarding Japanese encephalitis among the villagers of Alipurduar District, West Bengal, India.

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Table 1: Demographic distribution of study population (n=460).

VARIABLES		NUMBER	PERCENTAGE
SEX	MALE	111	24.13
	FEMALE	349	75.87
AGE	14-30	217	47.17
	30-45	132	28.69
	45-60	64	13.19
	> 60	47	10.95
CASTE	SC	170	36.95
	ST	32	6.95
	OBC	166	36.08
	OTHERS	92	20.02
RELIGION	HINDU	266	57.82
	MUSLIM	194	42.18
LITERACY STATUS	ILLITERATE	91	19.78
	PRIMARY	124	26.95
	MIDDLE	92	19.99
	SECONDARY	125	27.17
	HIGHER SECONDARY	23	4.99
	GRADUATE	5	1.08
SOCIO ECONOMIC CLASS	I	0	0
	II	5	1.08
	III	33	7.17
	IV	238	51.73
	V	184	39.99

- To find out the association (if any) between socio-demographic characteristics and knowledge and practice among the study population.
- To provide recommendations accordingly.

Materials and Methods

The present community based study was cross sectional in design and conducted between October 2014 and March 2015, at Dhulagaon village, Jateswar 1 Gram panchayat, Falakata block, Alipurduar District, West Bengal, India. The village was selected for history of recent outbreak there. Dhulagaon is a small village with 497 households. Assuming 50% of household have good knowledge, precision 10%, s=4 PQ/L^2 and another 15% was added for non-responses sample size was calculated 460 household respondents. Simple random sampling method was used to meet the sample size of the households and house to house interview was conducted by using predesigned pretested schedule for data collection. The schedule initially developed in English and translated in local language i.e. Bengali as the mother language of this locality is Bengali. Every house is visited three times if found locked to before declaring non respondents [14-16]. One available member from every selected house was interviewed after getting their written consent. We selected the cut off age of the respondents 14 years as it is the cut off age for junior high school standard, so those who were in school must had some knowledge in science and environment and those who were drop out usually engaged for money making and had access to youth-club, ICDS centre etc. About 30-40 minutes had given to each respondent for interview (the time was considered by pretesting the schedule on 20 samples). Ethical clearance was taken from Ethical committee of the AIIHPH. Data was entered into Microsoft excel 2010 and analysed there by using percentage, $\chi 2$ and Pearson correlation test where applicable.

For analysis purpose we made the scoring of each questions. Each right answer was scored as 1 and wrong was as 0. Out of total questions regarding knowledge score more than 75% was considered as 'good', (Table 2) more than 50% was 'Average' and below 50% was 'Poor'. In case of practice we described satisfactory (which includes 'good' and 'average') when score was more than 50% and unsatisfactory when it is below 50%.

Results

In our study population 24.13% are male. Majorities i.e. 47.17% are within 14-30 years age group and only 10.95% are above 60 years of age. Regarding social group we found SC 36.95%, ST 6.95%, OBC 36.08%, others 20.02%. 57.82% of populations are Hindu. According to literacy status 19.78% illiterate, 26.95% having primary, 19.99% middle, 27.17% secondary, 4.99 higher secondary and only 1.08% having education up to graduation level. As per modified B G Prasad scale for May 2014 51.7% of the population are in socio economic class IV and 39.99% are in class V.

217 (47.17%) of our respondents are younger than 30 years of age (30 was the median age of the respondents under this study) and the rest 243 (52.87%) are older than 30 years of age and the difference of knowledge among them is statistically significant ($\chi 2=23.21$, p=.000, DF=2).Among the respondents 111 (24.13%) are male and the rest of 349 (75.87%) are female, the difference in knowledge is not statistically significant ($\chi 2=3.75$, p=.153, DF=2). Among the study population 266 (57.83%) belong to Hindu community and the rest of 194 (42.17%) belong to Muslim community, the difference of knowledge in these two population groups is statistically significant ($\chi 2=9.44$, p=.009, DF=2). Among the households 202 (43.14%) are from scheduled cast or tribe and the rest 258 (56.08%) are from general caste or other backward class and knowledge about JE differ significantly between them ($\chi 2=23.48$, p=.000, DF=2). 307 (66.74%) of the respondents are educated up to class VIII and the rest 153 (33.26%) are educated above that and their knowledge differ significantly ($\chi 2=20.69$, p=.000, DF=2). 38 (8.26%) families are of high socio economic status (class I,II & III of modified B G Prasad scale for May 2014) and the rest 422 (91.74%) families are of low socio economic status and the knowledge varies significantly among them ($\chi 2=8.08$, p=.018, DF=2).

In our study we have found that presence of good knowledge (score >75%) does not lead to satisfactory (good or average) practice (score > 50%) and only 6 (1.3%) respondents have good practice score among which none has good knowledge score. There is weak positive correlation between knowledge and practice (r=0.226). 34.56% population younger than 30 years have unsatisfactory practice score compared to 32.51% of older than 30 years age group which is not statistically significant ($\chi 2=0.22$, p=.641, DF=1). 121(34.67%) female respondents compared to 33 (29.73%) male respondents have unsatisfactory practice score which is also not statistically significant ($\chi 2=0.92$, p=.336, DF=1). Unsatisfactory practice score is

Table 2: Association between knowledge score and selected demographic.

Variables		knowledge about Japanese Encephalitis						p value
		Good	%	Average	%	Poor	%	
1. Age group								
	<30 years (N=217)	40	18.43	127	58.53	50	23.04	.000
	≥30 years (N=243)	20	8.23	121	49.79	102	41.98	
2. Sex								
	Male (N=111)	9	8.11	60	54.05	42	37.84	.153
	Female (N=349)	51	14.61	188	53.87	110	31.52	
3. Religion								
	Hindu (N=266)	45	16.92	132	49.62	89	33.46	.009
	Muslim (N=194)	15	7.73	116	59.79	63	32.47	
4. Social Group								
	SC-ST (N=202)	40	19.80	86	42.57	76	37.62	.000
	OBC-Others (N=258)	20	7.75	162	62.79	76	29.46	
5. Education								
	<class VIII (N=307)	37	12.05	147	47.88	123	40.07	.000
	≥Class VIII (N=153)	23	15.03	101	66.01	29	18.95	
6. Social class								
	I-III (N=38)	8	21.05	25	65.79	5	13.16	.018
	IV-V (N=422)	52	12.32	223	52.84	147	34.83	

Table 3: Association of practice regarding prevention & control of JE with Socio-demographic factors (n=460).

Variables		Practice regarding control and prevention of JE				p value
		Satisfactory	%	unsatisfactory	%	
1. Age group						
	<30 years (N=217)	142	65.44	75	34.56	.642
	≥30 years (N=243)	164	67.49	79	32.51	
2. Sex						
	Male (N=111)	78	70.27	33	29.73	.337
	Female (N=349)	228	65.33	121	34.67	
3. Religion						
	Hindu (N=266)	159	59.77	107	40.23	.000
	Muslim (N=194)	147	75.77	47	24.23	
4. Social Group	SC-ST (N=202)	118	58.42	84	41.58	.001
	OBC-Others (N=258)	188	72.87	70	27.13	
5. Education						
	<class VIII (N=307)	215	70.03	92	29.97	.024
	≥Class VIII (N=153)	91	59.48	62	40.52	
6. Social class						
	I-III (N=38)	29	76.32	9	23.68	.182
	IV-V (N=422)	277	65.64	145	34.36	

more among Hindu population (40.23% compared to 24.23%) which is statistically significant ($\chi2=12.89$, p=.000, DF=1). Households belonging to general caste or other backward class have significantly less ($\chi2=10.62$, p=.001, DF=1) unsatisfactory practice than scheduled caste or tribe households (27.13% compared to 41.58%). Respondents having lower education (<class VIII) have significantly less ($\chi2=5.11$, p=.024, DF=1) unsatisfactory practice score than respondents with education > class VIII (29.97% compared to 40.52%). In our study

Table 4: Distribution of study according to knowledge and practice regarding prevention & control of JE (n=460).

KNOWLEDGE	PRACTICE			
	good	average	poor	total
Good	0	57	3	60
Average	2	165	81	248
Poor	4	78	70	152
Total	6	300	154	460

lower (class I,II&III) socio economic class have more unsatisfactory practice score (34.36% compared to 23.68%) though statistically not significant ($\chi 2=1.78$, p=.181, DF=1).

Discussion

To achieve best results in JE control it is important to have active community participation. Community participation in turn depends on people's knowledge and practices towards the disease [17]. In our study population there is a knowledge gap regarding JE, its transmission and vector control. Only 24.13% of our study populations are male, being a rural area of mainly lower socioeconomic status, male members of the families were out of station for work during our visit days. Jain et al in a study done in Uttar Pradesh showed that Males were more commonly affected than females [18] and it is reflected in our study that males are having knowledge gap regarding JE occurrence, causation, spread etc. Among our study population 56.83% belong to Hindu community of which 49.14% are scheduled caste and scheduled tribe, whose social practice is cattle breeding (specially piggeries) close to human dwelling [19]. Having piggeries/ cattle sheds close to human dwellings are common phenomena in rural settings can be an important factor for the recent outbreak in that study village as rice cultivation and pig rearing are essential to the economy in this population. In a case-control study W. LIU identified proximity to rice fields (OR 2.93, 95% CI 1.57–5.45), pig ownership (OR 2.24, 95% CI 1.17–4.26) as being independently associated with the risk of JE [20,21]. Although sporadic cases are reported throughout the year a distinct peak of JE was seen in the monsoon and post monsoon season indicates that vector breeding in paddy fields as the important cause. [18,21] Regarding knowledge score education up to class VIII mark has been taken as in West Bengal schooling has been free under child rights to education which helped us to assess the knowledge of the study population majority of which are in lower socioeconomic strata. Having knowledge related to JE did not lead to good practices regarding preventive measures can be explained by the lack of IEC on the part of various social and health sectors. In this study we found those who had age below 30 (median age in this study), had average to good knowledge as the respondents in this age group mainly were school or college going students or those who were drop out but had access to youth-clubs or local ICDS centre and these age group also had interest in different media like television or internet which we found the main source of their knowledge. Knowledge about mosquito borne diseases and mosquito preventive measures are associated with educational status of the study population. Simple Information on JE the causative factor, transmission and prevention of mosquito bites (Table 3), Community action in reducing mosquito breeding places by filling pools, weekly drainage of accumulated water, lowering of water levels in rice fields etc can improve the situation a lot [22,23]. 91.74% families are of low socio economic status and the knowledge varies significantly among them (Socio economic classification was according to Modified B G Prasad Socio Economic Status classification revised for 2014) [22]. Though male and female both sex had average knowledge but we found female were having satisfactory practices and this was applicable for both working and house makers. Usually those women who worked outside had more knowledge and their source of knowledge mainly health service providers and the IECs done by health and family welfare department. Religion and social castes had no relation with good or poor knowledge but Muslims were found to have satisfactory practices and this is also reflected among OBC-other casts. In our study it was found that the Hindus were having farm with pigs when the Muslims didn't have (as per their religion they do not rear pigs). It is clearly seen that those who had educations (studied in higher classes at least upto VIII standard) had satisfactory practice. We couldn't find any relations between social status and knowledge/practices (Table 4).

Conclusion & Recommendation

In areas at risk JE is primarily a disease of children but can occur among travellers of any age. Prevention therefore is by avoidance of mosquito bite and vaccination.

The JE vaccines had already been integrated into National Immunization Program (NIP) in few states and affected districts. Considering the complexity of JE/AES problem and the urgency of addressing the adverse consequences of the growing incidence of JE/AES through a multi-pronged strategy, it has been decided to launch a comprehensive National Programme on Prevention and Control of JE/AES with the participation of concerned Ministries/ Departments. JE vectors are exophillic and endophagic in nature. The risk of transmission increases when the human dwellings and animal sheds particularly piggeries are situated very close to each other. Because of outdoor resting habits and crepuscular nature, the vector control using indoor residual spray is technically not effective. In addition to this, due to vast and enormous breeding habitats like perennial ponds, paddy fields and other water bodies, larval control using various anti larval measures is also not feasible as it is resource intensive. Therefore, vector control using ULV (ultra-low volume) fogging is the only recommended method of vector control and can be used during JE epidemics also.

We found a low level of 'good knowledge' and 'good practice' in our sample population and level of knowledge and practice also varies with different socio demographic variable. So, there is an urgent need of intervention in terms of awareness generation. This can be achieved through IEC/BCC programme on JE with active community participation by involving PRI and community leaders and other stakeholders with special emphasis over schedule cast and tribe community and socioeconomically weaker section. The mobilization of female health volunteer will be very helpful in this context as they have good network in the community. Beside health education using mass media at national level, poster, interpersonal communication and folk media will be an effective tool for this population in terms of their accessibility and affordability. A periodic monitoring and evaluation system should also be incorporated to make this BCC programme effective. Such programme is crucial to improve

community participation towards adopting effective measures for preventing disease transmission, vector control, improve surveillance and health seeking behaviour and thus we can achieve a better controlling of outbreak.

Special emphasis must be given on JE vaccination. Maximum numbers of beneficiary must be covered either routine or campaign mode. Sufficient supply of logistics, proper cold chain maintenance and mobilization of beneficiaries are the crucial point for success against battle with JE.

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