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Awareness and Prevention of Japanese Encephalitis among the people of Eastern U.P.

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Abstract: The problem of Japanese encephalitis (JE) is very wide spread in India and especially in the eastern U.P. The prevention of spreading Japanese encephalitis is the most necessary and challenging task. Awareness and prevention about JE can be one of important factors in controlling this vital disease. This study was planned to investigate the level of awareness and prevention among the people of Eastern Uttar Pradesh. The sample of 240 respondents (adult N=120 & Adolescents N=120). They were equally selected from Rural and Urban areas. An open ended semi-structured interview exploring the awareness and prevention of participants was carried out. The result showed that responded of both groups had low level of awareness about causes, symptoms and effort to prevent Japanese Encephalitis. On some aspects of awareness, adolescents and rural participants showed more knowledge and awareness in comparison to Adults and Urban participants but it was not very noticeable difference.
Keywords: Japanese Encephalitis, rural and urban society, awareness, prevention

INTRODUCTION

Japanese encephalitis (JE) is a common mosquito borne fla-viviral encephalitis. It is one of the leading forms of viral encephalitis worldwide, mostly prevalent in eastern and southern Asia, covering a region with a population of over three billion. Ghosh D, Basu A [1]. Most infections of JE are asymptomatic, but if clinical illness develops, it causes significant morbidity and mortality. Though underreported, JE causes an estimated 50,000casesand15,000 deaths annually. Tsai TF. [2]. JE is a disease of public health importance because of its epidemic potential and high fatality rate. In endemic areas, the highest age-specific attack rates occur in children of 3 to 6 years of age. Grossman RA, Edelman R, Chiewanich P, Voodhikul P, SiriwanC [3], HokeJr CH, Vaughn DW, Nisalak A, et al. [4]. Approximately one third of patients die, and half of the survivors suffer severe neuropsychiatric sequelae from the disease. Solomon T, Dung NM, Kneen R, et al. [5].

In India, epidemics of JE are reported from many parts of the country, and it is considered a major pediatric problem. The first recognition of JE based on serological surveys was in 1955,

In Tamil Nadu, India. Namachivayam V, Umayal K [6]. A total of approximately 65 cases were reported between 1955 and 1966 in Southern India. Carey DE, Myers RM, Pavri KM [7]. Subsequent surveys carried out by the National Institute of Virology of Pune indicated that approximately half of the population in Southern India has neutralizing antibodies to the virus. Since 1955, many major outbreaks in different parts of the country have been reported. A major outbreak resulting in a 42.6% fatality rate was reported in the Bankura District of West Bengal in 1973. Subsequently, the disease spread to other states and caused a series of outbreaks in different parts ofthe country. In 1978, cases were reported from 21 states and union territories. Diagana M, Preux PM, Dumas M[8].In Uttar Pradesh, the first major JE epidemic occurred in Gorakhpur in 1978, with 1,002 cases and 297 deaths reported. Many outbreaks were reported in Gorakhpur after the 1978 JE outbreak, with varying intensity and magnitude. Since 1978 to 2005, this encephalitis has taken more than 10,000 lives in the state. NVBDC P. Directorate General of Health services Ministry of Health and Family Welfare. New Delhi [9].The 2005 epidemic surpassed all previous reported outbreaks in the country. In that year, Uttar Pradesh faced a devastating outbreak of JE, mostly con- fined to Gorakhpur, with 6,061 cases and 1,500 deaths; another outbreak occurred in 2006, with 2,320 cases and 528 deaths. Similarly, JE cases in Uttar Pradesh were confined predominantly to Gorakhpur during 2007, with 3,024 cases and 645deaths, NVBDC P. Directorate General of Health services Ministry of Health and

Family Welfare. New Delhi [10]and then onwards till 2007 there have been 103,389 reported cases in India, and 33,729 deaths. Dhillon GP, Raina VK [11]. Approximately 597,542,000 people in India live in JE-endemic regions, and 1,500 to 4,000 cases are reported every year. Kabilan L. [12]. These figures are based on total reported cases; it is possible that many cases are unreported and hence the actual magnitude of the threat of JE may be consider ably higher, both in the Indian and in the global context.

JE virus (JEV) ecology has been widely studied. The virus exists in a zoonotic transmission cycle among mosquitoes, pigs, bats, and water birds belonging to the family Ardeidae (cattle egrets and pond herons). Humans become infected when bitten by an infected mosquito and are a dead-end host because of low viremia, preventing the virus from being transmitted further. The major mosquito vectors of JEV vary in different geographic regions; the most common are those of the *Culex* genus. Pigs are the main contributors in the transmission cycle with respect to human infection, because these animals often stay close to human dwellings. Ardeid birds are important maintenance hosts. Recently, JEV antibodies were detected in bats, revealing that bats can be a part of the JEV transmission cycle. Vertical transmission of JEV in mosquitoes probably explains the "overwintering" of virus between epidemics. JEV infection in domestic animals and other vertebrate species such as equines does not result in high viremias; thus, they are not expected to transmit the virus to humans. Amphibians and reptiles can be infected experimentally, but their role in overwintering and maintenance in the environment is not known.

SYMPTOMS

• Encephalitis is the major form of the disease, although other, less severe forms, such as aseptic meningitis or simple febrile syndromes accompanied by headache, are also frequent.
• After an incubation period of 5 to 15 days, the disease is characterized by the abrupt onset of high fever accompanied by headaches, behavioral changes, as well as speech and motor disorders (paralyses).
• The evolution of the disease is marked by the gradual onset of consciousness disorders that can evolve to coma. The mortality rate of Japanese encephalitis is high and sequelae are common, especially among children (up to 50%).
• There is no specific treatment for the disease.

Parida M,Das P.K., Tripathi N.K.et al[13] reported in-depth investigations of JEV-specific antibodies, virus isolation, and demonstration of viral RNA in 326 febrile patients with encephalitis symptoms who were admitted to B.R.D. Medical College, Gorakhpur. Further molecular epidemiologic studies were performed to establish the genetic relatedness of the viral strain associated with this epidemic.

A disturbing news item that was aired on news channels in August 2008 reported that the "kidkiller" in Uttar Pradesh (UP) had struck again. Hospitals were flooded with patients, proper medical treatment was unavailable, and many people died.

This has been a very common report coming nearly every year from UP in northern India, which has become an epicenter for the killer disease Japanese encephalitis (JE). About 1,000 children die of this brain fever in UP every year. Statistical records show that more than 25,000 children have died of JE in the region since 1978, and the disease was started to be treated as a national health emergency in India in 2007.

In Gorakhpur, on May 2006 College and school students took out a march to create awareness about encephalitis among the residents on Wednesday. Hundreds of students carrying placards and banners reading 'Fight Encephalitis and Clean India, beautiful India took to the streets in Gorakhpur district to reach out to the residents. District administration officials also took part in the march. The symptoms of encephalitis include headache, fever, convulsions, drowsiness, fatigue and the inflammation of the brain. District Magistrate Ranjan Kumar said Gorakhpur is highly prone to the disease. The encephalitis outbreak in Gorakhpur has attracted national and international attention as in 2005 a virulent outbreak of Japanese encephalitis in Gorakhpur killed 1,000 people, mostly children. This was the worst outbreak since 1978. Encephalitis is caused by mosquitoes that breed in stagnant water. Therefore, hygiene becomes essential in preventing the disease from spreading.

Objectives- The main objective of this study is to explore the level of awareness about Japanese encephalitis among the people of Eastern Uttar Pradesh. Followings are the general objectives of this study-

1- To explore the level of awareness and prevention among adolescents and adults of Eastern U.P.
2- To explore the level of awareness and prevention among the people of rural and urban society of Eastern U.P.

METHOD

Sample- A sample of total 240 respondents was selected from the different arias of Eastern U.P. i.e. Sant Kabir Nagar, Basti, Deoria, Gorakhpur and Maharajganj for the study. The total sample was equally divided into two age groups- Adults and Adolescents, two societies- Rural and Urban.

Tool- An open ended survey questionnaire was developed for this study containing total 9 questions

about the awareness and prevention about Japanese encephalitis. All the questions were in Hindi. Following were the questions-

1- Have you ever heard about encephalitis?
2- What do you know about this? Please explain in details.
3- From which sources, do you come to know about this disease?
4- What are the reasons of spreading encephalitis?
5- What are the symptoms of encephalitis?
6- From where one can get help on being the victim of encephalitis?
7- What efforts are done for the prevention of encephalitis by you?
8- What are the programs of health department for encephalitis?
9- What should be done to create more awareness among the people about this problem?

Procedure-After taking the informed consent from the respondents, the data collection was done. All the information provided by the respondents was noted carefully. Each and every respondent was approached individually.

RESULTS & DISCUSSION

For getting the results, analysis of responses was done. In this process wrong content information were excluded and only the right information obtained by the respondent was analyzed and kept as a category of response.

Table- 1: Percentages for awareness about Japanese Encephalitis.

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Yes	92.5	95.8	92.5	95.8
No	7.5	4.2	7.5	4.2

It is clear from the table -1, that most of the respondents (approx. 93%) were aware of the term encephalitis. Among them adolescents participants were more aware than that of adults. Urban participants were expressing more awareness for the familiarity of encephalitis (95.8%) than that of Rural participants.

Table-2: Percentages for knowledge about Encephalitis

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
High fever	50	48.3	42.5	55.83
Mosquitos	25.83	26.67	26.67	25.83
Paddy fields	21.67	12.5	14.16	18.83
Fatal disease	5	27.5	23.33	9.16
Pigs	36.67	22.5	23.33	36.67
Child disease	29.16	30	27.5	31.67
Filth	28.33	40	51.67	25
Average	**28.09**	**29.63**	**29.88**	**29**

Table 2 is showing the analyses of respondent's overall knowledge about encephalitis. High fever, one of the important symptoms of encephalitis was the most frequent response from all the four groups. The responses show that all the groups had shown approximately equal knowledge about Japanese encephalitis. Adolescents participants in comparison to adults and rural in comparison to urban participants had shown little more knowledge about this disease.

Table- 3: Percentages for sources of Knowledge about J.E.

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Television	35	50	39.16	44.16
News paper	55.83	46.67	43.33	50.83
Internet	6.67	40	23.33	33.33
Real incidents	20	23.33	27.5	35.83
Books	20.83	15.83	34.16	5
Radio	7.5	11.67	13.33	15.83
Posters	24.16	15.83	19.16	12.5
Campaign	42.5	22.5	25	16.67
Average	**26.56**	**28.22**	**28.12**	**26.76**

Table3 is related to the source of knowledge. Television was the most talked response by adolescents but adults reported newspaper as their source for knowledge for JE. Internet was one of the important sources of information for adolescents but not for adult respondents as only 6.67% of adults has talked for internet in comparison to 40% of adolescents. Real incidents, Books, radio, posters and Campaign were other responses. Books, posters and campaign were responded more by the adults in comparison to adolescents but Radio and real incidents seems to have an important source of knowledge for adults. Posters and campaigns were playing important role for rural participants in awaking about encephalitis. The overall responses of adolescent were higher than that of adults and the responses of rural participant were higher than that of urban participants about the sources of their knowledge of J.E. but the difference was not very high.

Table-4: Percentages for reasons of spreading Japanese Encephalitis

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Mosquitos	32.5	47.5	60.83	47.5
Polluted water	27.5	17.5	21.67	14.16
Pigs	33.33	29.16	40.83	23.33
Filth	35.83	45.83	30.83	42.5
Average	**32.9**	**35**	**38.54**	**31.87**

Among the reasons for spreading encephalitis Mosquitoes, polluted water, pigs and filth were the occurred responses from all the four groups. This is to be noted that there is a much difference between the responses of the two groups. According to urban population filth is the second most cause of spreading encephalitis but for rural pigs is the more responsible in spreading encephalitis in comparison to filth and polluted water. Adult and adolescents participants accused filth as the second leading reason for encephalitis but adolescent's percentage is higher than adults. Here once again adolescents' participants(35%) were showing more knowledge and awareness than adults(32.9%) about the reasons of spreading Japanese encephalitis. On the other hand rural participants(38.54%) were showing more awareness and knowledge about the reasons of spreading J.E. than urban participants (31.87%).

Table-5: Percentages for symptoms of Japanese Encephalitis

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Fever	52.5	43.33	39.16	52.5
Headache	49.16	21.67	58.33	19.16
Unconsciousness	20.83	26.67	20.83	33.33
Vomit	10.83	28.33	20.83	27.5
Starchiness	20	20	18.33	12.5
Seizure	20	50.83	24.16	50.83
Average	**28.89**	**31.84**	**30.27**	**32.67**

Here we can see that all the four groups h reported 'fever' as one of the most salient symptoms of encephalitis. It was the leading response of adults and urban group. Headache (50.83%) was the most frequent response of rural group and seizure was of adolescents. Headache was the second leading response of adults after that unconsciousness, starchiness and seizure were reported. Urban participants reported fever, seizure, Unconsciousness and vomiting as leading symptoms of encephalitis. The average of responses showed that adolescents had more knowledge and awareness about the symptoms of J.E. than those of adult participants. It is in contrast to the earlier results of this study, urban participants showed higher knowledge and awareness in comparison to rural participants.

Table- 6: Percentages for resources of getting Help

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Hospital	32.5	48.33	36.67	64.16
Health center	36.67	47.5	35	42.5
Average	**34.58**	**47.91**	**35.84**	**53.33**

Hospital and Health center were the two responses by all the four groups. Among them adolescents and urban participants showed more knowledge and awareness in comparison to rural and adult participants. The responses for hospital and health center were similar in the groups of adolescents and rural participants. However adolescent participants as reported in the study showed more knowledge and awareness than adult participants.

Table-7: Responses related to prevention of Japanese Encephalitis

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Avoiding pig farms	37.5	6.67	9.16	43.33
Cleanliness	30.83	50.83	26.17	28.33
Awareness	19.16	6.67	9.16	16.67
Use of mosquito net	27.5	22.5	29.16	19.16
Use of boiled water	12.5	25	21.67	17.5
Vaccination	34.16	28.33	24.16	41.67
Average	**26.94**	**23.33**	**19.91**	**27.78**

When asked about the efforts done to avoid Japanese encephalitis on their own level by the subjects, they reported avoiding pig farms, cleanliness, awareness, use of mosquito net, use of boiled water and vaccination. The most frequent effort reported by adult and urban participants were avoiding pig farm but this was very low in the responses of adolescents and rural participant. It might be because the adolescents and rural participants were not very much aware of the role of pigs in spreading J.E. Cleanliness was one of the most frequent responses of all the four groups.

Table-8:Responses related to Government Programs about Japanese Encephalitis

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Vaccination	50	48.33	36.67	35
Pesticide spraying	20.83	12.5	27.5	20.83
Rallies &campaign	20.83	14.16	16.67	8.33
Average	**30.55**	**25**	**26.95**	**21.39**

This table shows that 50% of adults, 48.33% of adolescents, and 36.67% of rural and 35% of urban participants were aware about the effort of vaccination by the government to prevent J.E. The other responses about the efforts done by government were pesticide spraying and Rallies and Campaign.

Table-9:Responses related to suggestions

Responses	Adults N=120	Adolescents N=120	Rural N=120	Urban N=120
Television	40.83	48.33	34.16	37.5
Internet	20.83	21.67	9.16	35
Newspaper	41.67	29.16	37.5	22.5
Camps/Rallies	26.67	37.5	30.83	24.16
Average	**32.5**	**34.16**	**27.91**	**29.79**

Participants reported Television as the most helpful resource among all others because it was the most approachable source of media in Eastern U.P. The urban participants response for internet was high (35%) in comparison to that of rural participants(9.16%)only. This difference shows that the use of internet is not as popular among rural participant as it is in urban in Eastern U.P.

The overall result of this study showed lack of awareness and knowledge among the people of Eastern U.P. Though almost 94% 0f the respondents have heard about Japanese encephalitis yet the level knowledge and awareness about the symptoms, causes and efforts made to prevent J.E. was very low. Efforts made by the respondents were also low because of low level of knowledge and awareness. Dhakal S *et al* [14] examined the occupational risk of pig farmers in Nepal and determined their level of knowledge and practice of JE prevention techniques. They surveyed 100 randomly selected pig farmers in the Kathmandu District and found that pig farmers were exposed to many JE risk factors including poverty and close proximity to pigs, rice paddy fields and water birds. The overall result

showed that adolescent participants had more knowledge about symptoms, reasons and from where to get help, in comparison to adult respondents and rural participants showed more knowledge about reasons, efforts in comparison to that of urban participants. This may be because the adolescent population is more close to use of internet and media than adult population.

Implication of the study

Therefore, it is recommended that the reach of JE. Activities must improve particularly among the Population of Eastern U.P. Basic information related to prevention and control of JE can be taught from school age and at the same time strong preventive activities can be initiated to address the adults in the community because the best technique of get red from this epidemiology can be the prevention. Active participation of stakeholders, community volunteers and self-help group members should maximize community awareness and improve the performance of Japanese Encephalitis Control Program.

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