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Original Research Article

Assessment of knowledge regarding Nipah virus infection among physicians in a selected tertiary hospital, Rangpur, Bangladesh

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ABSTRACT

Background: Human Nipah virus (NiV) infection is an emerging zoonotic disease caused by the NiV resulting in severe illness in humans. The physicians can represent a lead role in disease prevention if they have the right knowledge regarding disease. This study aimed to state the assessment of knowledge regarding NiV infection among physicians in a selected tertiary hospital, Rangpur, Bangladesh.
Methods: A cross-sectional study was conducted among 211 physicians in Rangpur Medical College and Hospital by pretested structured questionnaire, from January 2020 to December 2020, using a convenient sampling method. Data were collected through face-to-face interviews.
Results: The majority of the respondents (69%) were within the 21 to 25 years of age group, mean age was 25±2.9 years where 54% of respondents were female. A questionnaire was comprised of 87 questions regarding knowledge on NiV infection. The findings revealed that 19% had good knowledge, 50% had fair and about 31% had poor level of knowledge regarding NiV infection. Among the respondents, 83% mentioned lack of awareness as a barrier regarding the prevention of NiV infection. Inferential statistics were done at a 95% confidence interval and 5% level of significance. Those who were aged between 21 to 25 years had significantly good knowledge than those who were more than 26 years of age (p=0.002).
Conclusions: This study concludes that knowledge of the physicians on NiV infection was at a fair or average level. There is a dire need for the routine integration of the awareness and safety precaution practice among the physicians.

Keywords: Nipah virus infection, Knowledge, Physician, Zoonotic diseases, One health

INTRODUCTION

Nipah is an immensely infectious viral zoonotic disease with a documented high case fatality rate as well as human-to-human transmission.[1] It is very important to optimize the diagnosis of diseases such as zoonosis that have a significant socio-economic impact on human life.[2] According to the World Health Organization (WHO), in the Southeast Asian region, Nipah virus (NiV) encephalitis is an emerging infectious disease of public health importance.[3] NiV belongs to the family of Paramyxoviridae, genus henipavirus, and it is an enveloped, negative-sense, single-stranded ribonucleic acid (RNA) virus. In Bangladesh, recurrent outbreaks of

NiV infection have been recognized since 2001.[4-6] 157 NiV infection cases were reported in Bangladesh during 2004–2012 and 33 outbreaks of NiV encephalitis were reported in Bangladesh and India between 2001 and 2014.[4] Animals are the primary carriers and reservoirs of many zoonotic infections. With a high diversity of wildlife, a high-density population, domestic animals, and wildlife, Bangladesh is a high-risk location for zoonotic spill over. Hence, animals provide serious health risks to humans.[7] Up to 75% of emerging infectious diseases as well as an estimated 60% of known infectious diseases are zoonotic in origin. Endemic diseases may demand a more detrimental and long-standing threat to both human and animal health indeed.[8] NiV is named by the village of "Sungai Nipah" in Malaysia where the virus was recognized in 1999 during an outbreak among pig farmers. Animal-to-human and human-to-human transmission both have been documented. NiV infection in humans has a variety of clinical manifestations along with encephalitis.[6] In Bangladesh, about three-quarters of those infected with the NiV have died of encephalitis.[4] Transmission of the virus from bats to humans occurs through consumption of NiV contaminated foods or raw date palm juice poisoned with bat saliva or urine.[4,6] There are no vaccines or antiviral drugs available at present for NiV disease and the treatment is just supportive. Interactions between humans, animals, and therefore the environment are key factors behind NiV outbreaks. Deforestation and urbanization of some areas in Bangladesh have contributed to greater overlap between human and animal habitats.[9] To mitigate the global consequence of emerging and endemic disease on both human and animal populations, the promotion of multi-sectoral collaboration between human and animal health sectors is obligatory. Towards improving animal and human health, one health approach is a critical step.[8] The importance of one health approach is particularly undeniable in the field of infectious disease.[9] This approach is necessary for the prevention and control of NiV infection.[10]

It is the first encounter for acquiring the infection in regards to physicians dealing with the Nipah outbreak if the cases aren't managed appropriately.[11] During a pandemic or disease outbreak, intensified awareness and actions of physicians conduct an inevitable role in contagion. Therefore, they must receive greater education along with knowledge regarding preventive strategies.[12] This study aimed to state the assessment of NiV infection among physicians in a selected tertiary hospitals.

METHODS

A descriptive cross-sectional study was undertaken to find out the physician's knowledge regarding NiV infection. The study was carried out from 01 January to 31 December 2020 through a face-to-face interview. The sample size was originally determined to be 384, but within the defined period, 211 participants were included in this study by convenient sampling method. It started with protocol development and was completed with the final report submission. The study was carried out by the physicians of Rangpur Medical College and Hospital, Rangpur, Bangladesh. It was carried out from the medicine department, surgery department, Paediatric department, orthopaedic department, gynaecological department, and ophthalmology department. There was a surveillance room for investigation of NiV suspected case in the medicine department.

Data were collected randomly for the study whose common indication of NiV infection using a structured questionnaire consists of 6 sections: socio-demographic details of the respondents; information related to knowledge on clinical features; information related to knowledge on reservoir; information related to knowledge on epidemiological link; information related to knowledge on preventive measures; information related to barriers for prevention of NiV infection. In section one, participants were asked to provide information about their personal and professional background. Section two, three, four and five consisted of 87 statements to assess the knowledge level of the respondents regarding NiV infection. These sections required a graded response to each statement on a two-point scale. Each statement was to be answered in either 'yes' or 'no'.[13] A score of '1' was given for 'yes' and '0' for 'no'. One could score a minimum of 0 and a maximum of 87 in this section. Section six consisted of barriers for prevention of NiV infection. The raw scores were calculated for all the statements of knowledge. Domain scores were calculated through summing answers to all questions in the domains. The mean and standard deviation for the samples and the range for the overall samples were calculated. Further the scores were converted to percentage. The scores less than 50% were considered as poor, the scores between 50% to 80% was considered as fair and the scores above 80% were considered as good with respect to knowledge score.[14]

After collection, the raw data were checked, cleaned, edited, and analysed by using the software statistical package for the social sciences (SPSS) [version 25]. Chi square test was used as appropriate, to evaluate the statistical significance of the differences between the responses of the participants. Inferential statistics were done at a 95% confidence interval and 5% level of significance.

Before the commencement of this study ethical approval of the research protocol from the institutional review board of the national institute of preventive and social medicine (NIPSOM) was taken.

Inclusion criteria

Physicians including all registered as well as intern doctors who worked at least 6 months at selected study places during data collection and who were willing to participate in this study and gave informed written consent were included.

Exclusion criteria

The physicians who were not willing to take part in this study were excluded.

RESULTS

The majority of the respondents (69.2%) were within the 21 to 25 years of age group, the mean age was 25.62±2.9 years where 54% of respondents were female. Among the respondents 96.2% were intern doctors, the mean monthly income was 195 USD (1 USD=85 Taka). The mean duration of the job was 1.24±1.39 years. Details of socio-demographic characteristics are as shown in Table 1. The questionnaire comprised of 87 questions, used to assess the knowledge of physicians regarding NiV infection. Among the respondents, 79.6% mentioned respiratory distress and 62.1% mentioned fever as clinical manifestation, 78.2% mentioned bat as a reservoir of NiV infection (Table 2). Eat raw date palm juice was mentioned as a route of transmission of the NiV by 70.1% of respondents (Figure 1). Not consuming raw date palm juice was mentioned by 84.4% of the respondents as a preventive measure of NiV infection (Table 2). The findings revealed that 19% had good knowledge, 50.2% had fair and 30.8% had a poor level of knowledge regarding NiV infection (Table 3). The age group of the respondents was associated with knowledge level (p=0.002). Co-relation between age and knowledge level indicates that the respondents belong to the age group of 21 to 25 had more knowledge than 26 years of age group (Table 4). Knowledge level regarding clinical features, reservoir, epidemiological link and preventive measures are shown in Table 5. Among the respondents, 83.4% mentioned lack of awareness as a barrier regarding prevention of NiV infection (Figure 2).

Table 1: Socio-demographic criteria of the respondents (n=211).

Variables	Frequency (%)	Mean±SD
Age group of the respondents (years)		
21 to 25	146 (69.2)	25.62±2.9
26 to 30	54 (25.6)	
Above 30	11 (5.2)	
Total	211 (100)	
Sex		
Male	97 (46)	
Female	114 (54)	
Educational level		
Graduate	203 (96.2)	
Postgraduate	8 (3.8)	
Monthly income (1 USD=85 BDT)		
Up to 200 USD*	194 (91.9)	
More than 200 USD	17 (8.1)	
Duration of job		
Less than 1 year	10 (4.7)	1.24±1.39
1 year	189 (89.6)	
More than 1 year	12 (5.7)	

*1USD=85 Taka

Table 2: Knowledge regarding Nipah virus infection (n=211).

Variables	Frequency (%)
Clinical manifestations	
Fever	131 (62.1)
Headache	125 (59.2)
Respiratory distress	168 (79.6)
Encephalitis	123 (58.3)
Convulsion	109 (51.7)
Muscle pain	39 (18.5)
Vomiting	62 (29.4)
Reservoir	
Bat	165 (78.2)
Preventive measures	
Not to consume raw date palm juice	178 (84.4)
Personal protective measures	104 (49.3)
Maintain physical distance	85 (40.3)

*Multiple responses

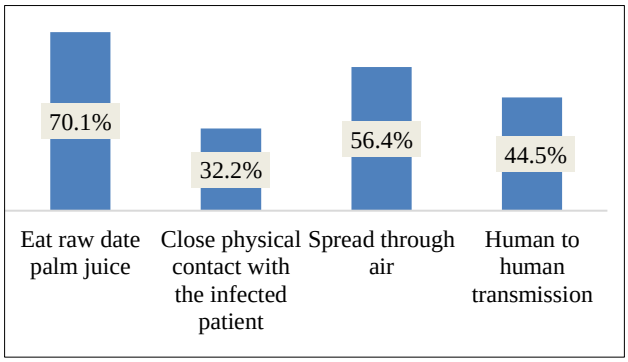

Figure 1: Knowledge regarding the route of transmission of Nipah virus (n=211).

Table 3: Knowledge level regarding Nipah virus infection (n=211).

Knowledge level of the respondents	Frequency	Percentage	Mean±SD
Good (>80%)	40	19	53±2.3
Fair (50-80%)	106	50.2	
Poor (<50%)	65	30.8	

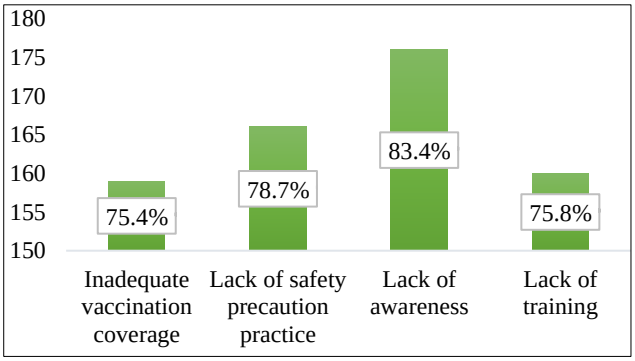

Figure 2: Barriers regarding prevention of Nipah virus infection (n=211).

Table 4: Association between knowledge level and age of the respondents (n=211).

Level of knowledge related to the age group of the respondents				Test of significance
Age group (years)	**Knowledge level (%)**			Chi-square test
	Good	**Fair**	**Poor**	χ^2=12.583
21 to 25	31 (21.2)	81 (55.1)	34 (23.3)	df=2
More than 26	9 (13.8)	25 (38.5)	31 (47.7)	p=0.002

Table 5: Knowledge level according to domain (n=211).

Variables	Categories	Frequency (%)	Mean±SD
Knowledge level regarding clinical features	Good	14 (6.6)	20.54±1.8
	Fair	118 (55.9)	
	Poor	79 (37.4)	
Knowledge level regarding reservoir	Good	130 (61.6)	8.26±3.8
	Fair	42 (19.9)	
	Poor	39 (18.5)	
Knowledge level regarding epidemiological link	Good	32 (15.2)	11.32±4.9
	Fair	119 (56.4)	
	Poor	60 (28.4)	
Knowledge level regarding preventive measures	Good	86 (40.8)	12.29±4.9
	Fair	80 (37.9)	
	Poor	45 (21.3)	

DISCUSSION

In Bangladesh, fewer number of studies have found regarding the knowledge of NiV infection among physicians. In this study, the mean age of the respondents was 25 years. In another study, a contradictory finding was revealed where the mean age of the participants was 30.01 years that was found higher than the present study.[1] Another contradictory finding was found, where the mean age of the respondents was 20±1.41 years.[13] The result was found lower than the present study because it might be that, all the respondents were students from first to final year comprised of the study population, and no intern or medical personnel were included whereas most of the respondents of present study were intern doctor. The present study revealed that the majority (54%) of the respondents were female. A similar result was found in a study where the majority (79.9%) of the respondents were female.[1] The result was found different in a study conducted in Pokhara where the majority (72.2%) of the respondents were male, it might be due to the respondents were poultry workers and they were more likely to be male.[14] The knowledge score found in this study was not so profound. Knowledge was assessed using questions regarding clinical features, reservoirs, epidemiological links, and preventive measures regarding NiV infection. The present study revealed that the majority (50.2%) of the respondents had a fair or average level of knowledge regarding NiV infection. A similar citation was found in a study where 45.47% of respondents had a fair level of knowledge regarding pandemic H1N1 influenza.[12] On account of the outbreak, a good knowledge score was required from medical interns because they are lifelong learners. In the present study, 32.2% of respondents mentioned that the NiV is transmitted by close physical contact with the infected patient, 56.4% mentioned that the NiV was spread through the air. These results were not consistent with the result of the study conducted in a Medical College Hospital in Kerala where 94.1% of respondents cited close contact with infected patients, 83.9% mentioned NiV was spread through the air as a route of transmission.[1] The present study revealed that, clinical manifestations of NiV infection indicated by the respondents were fever by 62.1%, headache by 59.2%, muscle pain by 18.5%. The results were not similar to a study conducted in a Medical College Hospital in Kerala, where clinical features indicated by the respondents were fever by 97.5%, headache 81.9%, body pain 78.4%.[1] The results were not similar because there might be different types of source along with symptoms were common in different geographical area. The present study revealed that human to human transmission was mentioned by 44.5% of respondents which was not consistent with the study in Pokhara where 18.8% indicated that human to human transmission is possible in the case of NiV infection.[14] The reason for disagreement was might be that, the knowledge of physicians regarding the transmission of NiV was better than that of poultry workers. This study revealed that bat was mentioned by 78.2% of the respondents as the reservoir of NiV where the similar finding was concluded in a study where *Pteropus* bats, was the natural reservoir of NiV, live in South and South-East Asian countries.[5,10,15] Drinking raw date palm juice collected during winter season, which is a delicacy in rural Bangladesh, was identified as a risk factor for Nipah infection.[5,15] A similar result was found in the present study cited by 70.1% of respondents. The present study revealed that the majority of the respondents (79.6%) mentioned

respiratory distress as a clinical manifestation of NiV infection. Similar results were found where a higher proportion of Nipah cases suffered from respiratory symptoms in Bangladesh than in Malaysia.[15] A different result was found in a study conducted in Pokhara where 19.5% of respondents indicated respiratory distress as a clinical manifestation of the NiV infection. The reason for being different result was might be that, the knowledge regarding clinical manifestations among physicians was better than the poultry workers.[14] The person-to-person transmission was a common mode of transmission in Bangladeshi Nipah cases which was similar to the present study mentioned by 44.5% of the respondents.[15] Many physicians cited that the NiV spread through the air. This concept which was prevalent among physicians was not obvious because a person-to-person transmission may occur from close physical contact especially by contact with body fluid.[6] So, the NiV does not spread through the air. Fiver was cited by 62.1% of the respondents as a clinical manifestation in the present study. A similar result was found in a study where the fever was correctly identified by the majority of participants.[13]

Another study was conducted in Pokhara where 9.9% of respondents mentioned fever and 9.4% mentioned headache as a clinical manifestation of NiV infection. In present study, headache was mentioned by 59.2% of the respondents. The reason for being dissimilar was might be that, the respondents of the study conducted in Pokhara were poultry workers who had little knowledge regarding the clinical manifestation of NiV infection rather than physicians.[14] In the present study, knowledge of physicians regarding preventive measures was mentioned by 49.3% of respondents where another study conducted in Pokhara revealed that 61.2% of respondents knew preventive measures of avian influenza. The reason behind the unlike result was might be that, in Pokhara, the respondents were poultry workers and they were directly attached with poultry than physicians, so they had to be more careful about the preventive measures regarding avian influenza. The results of this study showed that demographic characteristics such as the age of the respondents were significantly related to their knowledge level. In this study respondents of 21 to 25 years had significantly more knowledge than the rest age group of respondents. To see the association between age group and knowledge level of the respondents, Chi-square test was performed and the test was found significant. The p value was 0.002 ($p<0.05$). A similar study was not found. It might be due to the study procedure and variance in methodology, this type of association was found in the present study.

Limitations

This study was administered among the physicians working in a selected area and the results cannot be attributed to the whole health professional population. The sampling method of this study was convenient, so there might be a chance of bias.

CONCLUSION

The objective of the study was to state the assessment of knowledge regarding NiV infection among physicians. In conclusion, the outbreak of NiV infection could be mitigated from Bangladesh when it gets more attention and consideration from decision-makers. In the current study, a good proportion of the respondents were aware of NiV infection but not many had a good level of knowledge regarding the disease and physicians' knowledge related to the disease was influenced by their characteristics such as age. The majority of the respondents mentioned lack of awareness as an obstacle to acquiring due knowledge. More emphasis should be given to eliminate knowledge deficit to prevent the disease outbreak.

Recommendations

Need to improve physician's knowledge level in order to prevent disease outbreaks by providing more emphasis on training along with teaching curriculum. More and more emphasis should be given on awareness program to overcome the barriers for NiV prevention.

So, when planning further implementation initiatives related to NiV prevention in hospitals, these findings and perceptions must be taken into account by working together to identify and control of the disease, which become public health importance in Bangladesh.

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