

Nipah Virus Infection In Hospitalized Children: Clinical Presentation And Outcome

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Nipah virus, a member of the genus Henipavirus, a new class of virus in the Paramyxoviridae family is recently detected with high mortality in Bangladesh. Case fatality rate of this infection in Bangladesh ranges from 75-80%. There have been 11 outbreaks in Bangladesh during the period 2001-2011 killing 150 of 196 infected persons with case fatality rate 77%. But the case fatality rate of Nipah virus infection in hospitalized children (Pediatric ward of Rangpur Medical College Hospital, Rangpur, Bangladesh) based on outbreak (30th January to 4th February 2011 in Hatibanda of Lalmonirhat district, Bangladesh) was 100%. All patients were followed up and recorded accordingly. Serological test for this virus was done in IEDCR Dhaka, Bangladesh. Human infections are characterized by asymptomatic infection to fatal encephalitis. Infected people initially develop influenza like symptoms of fever, headaches, myalgia, vomiting and sore throat. This may be followed by dizziness, drowsiness, altered consciousness, and neurological signs that indicate acute encephalitis. Some people also experience atypical pneumonia and severe respiratory problems. Drinking raw date palm sap potentially contaminated with pteropid bat saliva usually available in the winter season and contact with an infected individual was identified as the major risk factors for acquiring the disease.

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Key words: Nipah virus, Paramyxoviridae, Pteroid bat, Bangladesh.

Introduction

Nipah virus is a recently identified paramyxovirus that is closely related to Hendra virus.¹ The first recognized outbreaks of Nipah virus illness in humans occurred in Malaysia and Singapore from September 1998 through June 1999; 283 persons, mostly pig farm and abattoir workers were infected through contact with sick pigs.²⁻⁶ A case-fatality rate of 40% was

observed in Malaysia and Singapore; patients presented primarily with CNS symptoms.^{2,7,8} A second outbreak of Nipah virus infection, with a case-fatality rate of 68%, occurred from January through February 2001 in Siliguri, India, a town close to the northern border of Bangladesh. Patients affected by this outbreak presented with both encephalitis and respiratory symptoms.⁹ Fruit bats of the genus Pteropus are the apparent natural

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reservoir for the virus and may shed Nipah virus through their saliva and urine.¹⁰ Bats frequently visit date palm trees, lick the sap stream and their saliva and/or urine gets mixed with the sap which can contaminate it with Nipah virus. Previous outbreak investigations in Bangladesh have identified drinking raw date palm sap as a risk factor for Nipah virus transmission.¹¹ Nipah virus also transmits from person to person.^{2,4} In Bangladesh, 11 outbreaks of Nipah virus infection were identified during the period 2001–2011. Among the 153 cases detected in outbreaks and as sporadic cases during this period, 111 (73%) died. We describe the clinical presentation and outcome of Nipah virus infection in hospitalized children (Pediatric ward of Rangpur Medical College Hospital, Rangpur, Bangladesh) based on recent outbreak (30th January to 4th February 2011 in Hatibanda of Lalmonirhat district, Bangladesh).

Methods

Clinical observation and laboratory results were recorded prospectively. All patients were treated in tertiary level hospital (Medical college based hospital) by experienced paediatrician with all facilities. The outbreak region was Hatibanda near the hospital. For confirmatory test Nipah virus isolation was not done but serological test was done in IEDCR, Dhaka, Bangladesh. Initially patients were considered to have Nipah encephalitis if only came from area known to be involved in this outbreak. Encephalitis was defined by the presence of clinical signs and symptoms like fever, headache, altered sensorium or development of neurological signs. This statement accounted for 7 patients of 9 admitted patients with suspected Nipah encephalitis. Of 9 patients of Lalmonirhat, 7(78%) resided in Hatibanda. This number fulfills the criteria of outbreak of Nipah virus infection. Statistical analysis was done. All

patients were analysed clinically and outcome was recorded accordingly.

Results

The mean age of the cases were 4.7 years (range 1 to 10 years), male 7 (78%), female 2(22%, table VIII) of infected children who met the case definition died. Death occurred a median 4 days after the first reported symptoms of illness. Among clinical presentation the suspected cases experienced fever 9(100%), seizure 9(100%), unconsciousness 8(89%), respiratory difficulty 5 (56%, table I), and headache 5(56%). The clinical presentation started with mild to moderate fever, followed by altered mental status (Median time of illness 2 days, range 3-7 days); respiratory difficulty (median time 3 days, range 3 to 7 days after onset of illness). Among 9 suspected cases from the cluster area had confirmed by laboratory tests of which were 7 (78%) of IgM positive (table VII). 7 (100%) confirmed cases of Nipah encephalitis cases resulted in death (table IX). All patients died after collection of samples. Maximum duration of hospital stay (up to death) was 21 days; minimum duration was 1 day and average 6 days.

Discussion

During the outbreak 30th January to 4th February 2011 a total 9 patients were admitted with suspected Nipah virus infection. Of them came (100%) were paediatrics age group. All paediatric patients fulfill the criteria of encephalitis. The majority patients were lower social class (66%, table VI). Initial signs symptoms, special feature of encephalitis, case fatality were identified. All patients were treated and observed by paediatric specialist, SMO (Surveillance Medical Officer). Consumptions of fruits and fruits product (raw date palm juice) contaminated with urine or saliva from infected fruits bats. Here case definition based on epidemiological, clinical

and serological findings. Deterioration of consciousness leading to coma within 5 to 7 days.¹² Brain stem involvement is more severe among the cases.¹³ A small number may present with atypical pneumonia(HSU VP Hossain MY, Nipah virus encephalitis reemergence.¹⁴ On 30th January 2010), Aranyo, a 8yrs old boy got admission in pediatric ward (RpMCH) from Tongvanga, Hatibanda, Lalmonirhat who experienced fever, headache, altered mental status and with a history of date juice ingestion. On 31th January his sister Anonya, a 4yrs old girl got admission with same features. By 4th February 2010 another 5 children of different paediatric age groups got admission in this ward from aforementioned area with same presentation. So they were defined as probable cases of viral encephalitis most probably due to Nipah virus infection as they have history of having ingestion of date palm juice which might be contaminated by fruits bat. About 7 children met the outbreak associated encephalitis case definition, 2 cases does not meet the criteria. In all cases most common accompanying symptoms were fever, seizure and unconsciousness.

Table I: Symptoms of children with outbreak associated encephalitis

Symptoms and signs	Number (%)
Fever	9(100%)
Seizure	9(100%)
Unconsciousness	8(89%)
Headache	5(56%)
Respiratory difficulty	5(56%)

Table II: Neurological characteristics of patients during course of infection

Neurological Characteristics	Number
Altered Sensorium	9(100%)
Seizure	9(100%)
Unconsciousness	8(89%)
Absent DTR(Deep tendon reflex)	7(78%)
Extensor of plantar reflex	8(89%)
Glasgow coma sale(GCS) <5	5(56%)

Table III: Results of CSF

CSF findings	Results
Clear CSF	7(78%)
Haemorrhagic CSF	2(23%)
Lymphocyte count > 90%	9(100%)
Protein> 50mg/dl	8(89%)
Glucose< 40mg/dl	7(78%)

Table IV: Treatment options

Treatment given	Number (%)
Ceftriaxone	9(100%)
Acyclovir	9(100%)
Dexamethasone	9(100%)

Table V: Contact history

Types of contact	Number (%)
Ingestion of date palm juice	5(56%)
Ingestion of contaminated fruits	2(23%)
Handling of secretion and saliva	1(11%)

Table VI: Social class

Social class	Number (%)
Upper class	1(11%)
Middle class	3(33%)
Lower class	6(66%)

Table VII: Serological Confirmation

Serological findings	Number (%)
IgM positive	7(78%)
IgM negative	2(22%)

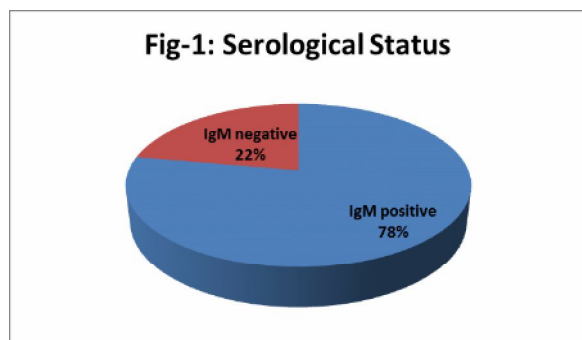


Table VIII: Distribution of Age and Sex

Name/Age	Sex	Number and percentage			
		Total Male	%	Total Female	%
Anonna, 4yrs	F	7	78	2	22
Oronno, 8yrs	M				
Sarani, 2.5yrs	M				
Jui, 4.5 yrs	M				
Sudipta Kumar, 10 yrs	M				
Sourob, 2yrs	M				
Kajal, 7yrs	M				
Farida akter, 4.5yrs	F				
Tamim 11months	M				

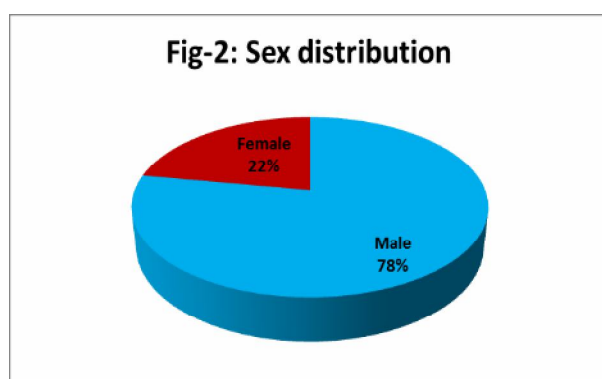


Table IX: Mortality profile

Total Number of Seropositive patient	Number of death (%)
Seven	7(100%)

Physicians who received the suspected cases, collected illness histories in treatment sheet form in a prescribed manner. They verified clinical information by physical examination. Specific health personnel appointed by ICDDR, Bangladesh was responsible for sample collection & obtained samples (blood, CSF, urine) from all living patient. Samples were then shifted on dry ice to IEDCR, Dhaka, Bangladesh through ICDDR and tested with an immunoglobulin M capture enzyme assay (EIA) for detection of Nipah IgM antibodies.

Conclusion

Nipah virus infection is a serious illness affecting the central nervous system and also respiratory system. The case fatality rate is 100% in this study. So emphasis should be given on prevention to reduce the mortality & morbidity from nipah virus infection. The important differences between the clinical presentation and outcome of Nipah encephalitis of Rangpur Medical College Hospital and from Singapore and Malaysia were analysed. The clinical presentations were almost same. In this outbreak high case fatality rate could be related to suboptimal health care in our present hospital setting in comparison to Singapore and Malaysia.

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