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Review

Public Health Awareness of Nipah Virus

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ABSTRACT

Nipah virus is an infectious disease. It emerging zoonotic disease. In 1998 were first occurred in the city of Kampong Sungai Nipah (river village) in the state of Perak west Malaysia. It associated with high mortality rate varies from 40% to 100% in human beings. In India seems the recently the third outbreak of re-emergence of Nipah virus from south India of Kerala, Kozhikode district in May 2018. Tests are used to diagnose the Nipah virus. Serum neutralization. Enzyme-Linked Immunosorbent Assay (ELISA). Polymerase Chain Reaction (PCR) assay. Immunofluorescence assay.Virus isolation by cell culture. The current status of vaccines are used to utilizing Hendra G protein and adjuvant such as Alhydrogel and CpG oligomer ox nucleotide has shown to be protective against Nipah Virus in multiple animal models. To use chlorinated lime to disinfected after culling of burial sites. In the contaminated areas and equipment to be disinfected with the sodium hypochlorite bleach. Incidence of Nipah virus discussed from 1998 to 2011. The prognosis of Nipah virus according to WHO fatality rate range from 45% - 75% depending upon the local capabilities for surveillance and clinical management. The differential diagnosis of Nipah virus infections are Dengue, Japanese encephalitis, Cerebral malaria, Scrap typhus, etc. clinical management of antiviral drugs, other drugs of antiviral contain monoclonal antibodies and host-directed interventions like immune modulators and adjunctive therapeutic. Supportive and general management and symptomatic treatment are seen. Criteria for transforming patient to ICU and to referral to higher centers to the critically ill patients. Early detection and clinical management of Nipah virus-infected patients are seen briefly.

Keywords: *Kozhikode District; Kampong Sungai; Nipah Virus; Pteropus Bats Species*

INTRODUCTION

Nipah virus is an infectious disease. It emerging zoonotic disease. It associated with high mortality rate varies from 40% to 100% in human beings. It affected both predominant respiratory and neurologic features. The recent outbreak for Perambra, Calicut district of Kerala, India. In this article mainly focused on giving awareness of Nipah virus.[1] Pteropodidoe family of the fruit bats are the natural host of NiV. Excretions and secretion of bats shed such as saliva, urine excreta, and semen.[2]

HISTORY OF OUTBREAK AND EPIDEMIOLOGY

In 1998 were first occurred in the city of Kampong Sungai Nipah (river village) in the state of Perak west Malaysia. At the first case of Malaysia 4 serum samples from 28 patients in this outbreak area encephalitis. In 1999 the second time occurred near Sikamat a small town in a different state of Negri Sembilan. Third, it is the largest cluster began near the city of Bukit Pelandck in the same state in December 1998 & January 1999. it is highly caused by direct physical contact with pigs clustering symptomatic cases among members of the same household was a highly 33%. The family Paramyxoviruses in the past was denoted as a group of viruses with narrow host range and typically caused outbreaks with low mortality rates. The report of sick animals with ill pigs developing a severe barking cough and many dying from the disease again not a features.[3]

An emerging zoonotic virus whose natural host is the Pteropus fruit bat, Nipah virus was first recognized in the late 1990s when an outbreak in pigs in Malaysia and Singapore moved to humans, killing 106 people.[4]

FIRST INCIDENCE FOR NIPAH VIRUS

- In 2011 West Bengal had the first outbreak was observed in Siliguri. In India without any involvement of pigs Nipah virus affected the humans.
- In 2007 Nadia district at West Bengal had a second incident recorded.
- The virus claimed over 300 live across Malaysia, Singapore, Bangladesh, and India between 1998 and 2008 according to WHO.[3]

NIPAH VIRUS INFECTION ACROSS THE GLOBE!

- According to ICMR in 2013.

• In 2001 – 2013 Bangladesh recorded several Nipah outbreak in humans almost every year.

• On Fruit bats or bats seropositive to Niv antibodies of the virus has been detected in Cambodia, Thailand, Indonesia and Madagascar in Southern Africa and Ghana in West Bengal.[3]

RECENT OUTBREAK OF NIPAH VIRUS IN KERALA MAY-2018

Kerala Kozhikode is on the high alert area of a deadly virus called 'Nipah' (NIV) claimed six lives in the other state. It is the fast-spreading virus Nipah reported has a high mortality rate of 70%.[3]

KERALA RECORDS 10 DEATHS DUE TO SUSPECTED NIPAH VIRUS INFECTION

Kozhikode: the symptoms of the contagious viral disease cause "the death toll due to contagious fever has risen to ten, including three confirmed Nipah cases and seven suspected deaths". The death of three more members of a family in Changaroth panchayat during the last fortnight was confirmed as due to Nipah virus in the tests conducted at National Virology Institute, at Pune, on Sunday. The recent victim suspected to have died due to Nipah infection in Lini, 31, a nurse of the Perambra Taluk Hospital. Lina, hailing from peruvannamuzhi, had tended to one of the patients, who was later confirmed to have had Nipah infection, at the Perambra Hospital.[3]

NIPAH VIRUS

Nipah virus is an emerging zoonotic infectious disease. It causes severe disease in human and animals. It transmitted from human to animals, the pteropodids virus of fruit bats is the natural host. According to the WHO family (fruit-eating species). [3]

Figure I. (Nipah virus: the New viral threat to human health) bankersadda.com

PROGNOSIS OF NIPAH VIRUS INFECTION

The prognosis of Nipah virus infections is far too poor. According to the World Health Organization fatality rate is estimated) to range from 40% - 75% depending upon the local capabilities for surveillance and clinical management (supportive care). The Survivors virus may have residual neurological problems such as seizures and/or personality changes. A few survivors who recover may subsequently relapse or develop delayed-onset encephalitis.[5]

SIGNS AND SYMPTOMS

• Infected people initially develop influenza-like symptoms of fever, headache, myalgia (muscle pain) vomiting, and sore throat.

• Dizziness, drowsiness, altered consciousness and neurological signs that indicate acute encephalitis can follow this.

• Some people can also experience atypical pneumonia and severe respiratory problem including acute respiratory distress.

Table 1. Mortality and Morbidity in Human Due to Nipah Virus Infection.[6]

S.No	Year/Month	Country	Location	No. of Cases	No. of Deaths	Case Fatality Rate%
1	Sep 1998, April 1999	Malaysia	Perak, Selangor, Nigeria Sembilan	265	105	39.6
2	Mar-99	Singapore	Singapore	11	1	9
3	Jan-Feb 2001	India	Siliguri	66	45	68.2
4	Apr-may 2001	Bangladesh	Meherpur	13	9	69.2
5	Jan-03	Bangladesh	naogaon	12	8	66.7
6	Tan-mar 2005	Bangladesh	Raj bari, Faridpur	67	50	74.6
7	Jan-mar2005	Bangladesh	Tangail	12	11	91.7
8	Jan-April 2007	Bangladesh	Kushtia, Naogaon, Natore, pabna, Thakurgaon	18	9	50
9	Apr-07	India	Nadia	5	5	100
10	Feb-Apr 2008	Bangladesh	Manikganj, Raj Bari	11	9	81.8
11	Jan-09	Bangladesh	Gaibandha, Nilphamari, Rangpur, Rajbari	4	1	25
12	Feb-Mar 2010	Bangladesh	Fairdpur, Gopalganj, Kurigram, Rajbari	17	15	88.2
13	Jan-Feb 2011	Bangladesh	Comilla, Dinajpur, Faridpur, Lalmohirhat, Nilphamari	44	40	90.2
14	Jan-12	Bangladesh	Joypurhat	12	10	83.3
15	Jan-Apr 2013	Bangladesh	Gaibandha, Manikganj, Naogaon, Natore, Pabna	24	21	87.5
16	Jan-Feb 2014	Bangladesh	13 districts	18	9	50
17	Mar-May 2014	philippines	Philippines	17	9	52.9
18	Jan-Feb2015	Bangladesh	Faridpur, Magura, Naogaon, Nilphamari, Ponchoghor, Rajbari	9	6	66.7
19	May-18	India	Kozhikode and Malappuram	18	17	94.4
			TOTAL	**643**	**380**	**59**

- Encephalitis and seizures occur in severe cases, progressing to come within 24 to 48 hours.
- The incubation period (interval from infection to the onset of symptoms) is believed to range between from 4-14 days. However, an incubation period as long as 45 days have been reported.[7]

DIAGNOSIS

These types of tests are used to diagnose the Nipah virus.

- Serum neutralization
- Enzyme-linked immune sorbent assay (ELISA)
- Polymerase chain reaction (PCR) assay
- Immune fluorescence assay
- Virus isolation by cell culture.[8]

Initial signs and symptoms of Nipah virus infection are non-specific and the diagnosis is often not suspected at the time of presentation. This can hinder accurate diagnostic and creates challenges in outbreak detection and institution of effective and timely infection control measures and outbreak response activities.

Main tests including Real-Time Polymerase Chain Reaction (RT_PCR) from bodily fluids as well as antibody detection of ELISA.[7]

Respiratory Involvement

Respiratory involvement was described in 14 to 29% of cases, although it was unclear if this was part of the initial presentation was secondary to aspiration or ventilator-associated pneumonia in Malaysia. In Singapore, had 2 to 11 patients h only respiratory symptoms and no encephalitis, while the remaining patients had encephalitis. In India and Bangladesh, had a high rate of respiratory cases had involvement, comprising half to two-thirds of cases, with some of them developing acute respiratory distress Syndrome? This difference may be related to differences between the two strains, as discussed later.[9]

Neurologic Findings

In the outbreak of Malaysian, MRI scans brain patterns revealed extensive involvement of the cortex, temporal lobe, and pons. Patients who relapsed or had late-onset encephalitis also had multiple areas of patchy and confluent cortical involvement.

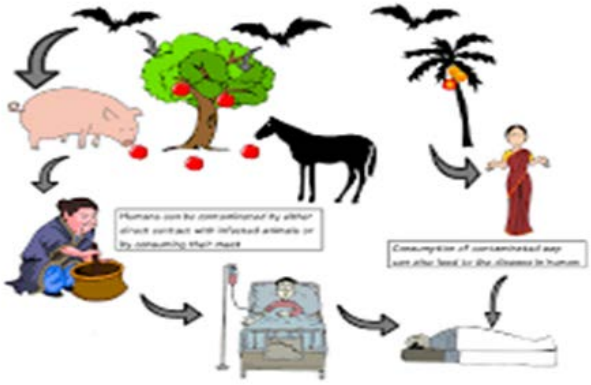
In patients in the Singapore outbreak, the MRI brain pattern was different, with multiple small (less than 1 cm in maximum diameter), bilateral abnormalities within the subcortical and deep white matter and some lesions enhanced after contrast media injection; other areas involved included the cerebral cortex, brainstem, and corpus callosum. Diffusion-Weighted (DW) MRI, a pulse sequence that has been widely used to detect ischemic stroke and cerebral Infarction, detected most of these lesions. This pattern of tiny DW abnormalities followed by T1 hyperintensities was distinctly different from the characteristic features of herpes virus and Japanese encephalitis, and it may be consistent with virus-associated micro angioplasty and subsequent ischemic micro infarction.[9]

DIFFERENTIAL DIAGNOSES

These are the different types of diagnosis of Nipah virus infection

- Dengue
- Japanese encephalitis
- Cerebral malaria
- Scrap typhus
- Bacterial meningitis
- Herpes simplex encephalitis
- Other viral encephalitis[10]

Figure 3. Transmission from bats to person



CURES/ THE KILLER VIRUS CALLED NIPAH: A REVIEW

There are three pathways of transmission of Nipah Virus from bats to people are identified in Bangladesh. The main route for ingestion of fresh date palm sap. Infrared camera studies are used to confirm a tap is cut into the tree trunk and sap flows slowly overnight into an open pot. Nipah virus outbreak in Tangail district, Bangladesh the only exposure the significantly associated with illness was drinking raw date palm sap (64% among cases versus, 18% among controls OR 7.9. 95%CI, 1.6, 38, p=0.01) in 2005. Through the domestic animals is the second route of transmission of Niv from bats to people in Bangladesh. Partially eaten saliva-laden fruit is the common drop of fruit bats. The contamination of date palm sap with bats feces is unfit for human consumption is also occasionally fed to domestic animals. It infected domestic animals with Nipah virus and shed the virus to other animals and humans. In 2001 was the strong association Nipah infection (OR 7.0, 95% CI, 2.2, 7, p=0, 01) and one family explained that they owned tow goats which their son frequently played with animals in Meherpur, Bangladesh in 2001.[11]

PERSON-TO-PERSON TRANSMISSION

In 2004 The clearest illustration of person to person Niv transmission occurred during the Faridpur outbreak in Bangladesh. Four persons who cared for the index patient--his mother, his son, his aunt and a neighbor--became ill 15–27 days after the index patient first developed illness. During her hospitalization, the index patient's aunt was cared for by a popular religious leader who lived in a nearby village and who became ill 13 days later. Many of his relatives and members visit the religious leader became seriously ill at his home. Then Twenty-two person developed Nipah infection after contact with the religious leader. One of these followers moved to his family's house in an adjacent village to receive care after becoming ill where he was cared for by a friend and two family members. These three caregivers and a rickshaw driver, who helped carry him to the hospital as his condition deteriorated, became ill. Ultimately, the chain of transmission involved 5 generations and affected 34 people physical contact with a NiV infected patient who later

died (OR 13.4, 95% CI 2.0, 89) was the strongest risk factor for developing NiV infection in the outbreak in Thakurgaon in 2007 six family members and friends who cared for a NiV infected patient developed Nipah infection. In a review of the 122 identified Nipah cases identified in Bangladesh from 2001 through 2007, 62 (51%) developed illness after close contact with another Nipah patient. A small minority of patients infected with NiV, 9 of 122 recognized cases (7%) transmitted NiV to 62 other persons. Anthropological investigations during the Faridpur outbreak highlighted multiple opportunities for the transfer of NiV contaminated saliva from a sick patient to care providers. Social norms in Bangladesh require family members to maintain close physical contact during illness. The more severe the illness, the more hands-on care is expected. Family members and friends without formal health care or infection control training provided nearly all the hands-on care to Nipah patients both at home and in the hospital. Care providers during the Faridpur outbreak continued to share eating utensils and drinking glasses with sick patients. Leftovers of food offered to see Nipah patients were commonly distributed to other family members. There was a particularly strong desire to have close physical contact near the time of death, demonstrated by such behaviors as cradling the patients head on the family member's lap, attempting to give liquids to the patient with a spoon or glass between bouts of coughing, or hugging and kissing the sick patients.[11]

CLINICAL MANAGEMENT

In Niv infection there is no specific drugs or vaccines currently, although this is a priority disease on the WHO R&D blueprint. It needs to treat intensive supportive care recommended for severe respiratory and neurological complications.[12]

ANTIVIRAL DRUGS

In WHO essential medicines list for Ribavirin Ribavirin is a guanosine analog and broad-spectrum nucleoside antimetabolite antiviral drug. The indication to treat the inhalation solutions of ribavirin, in young children, of severe lower respiratory tract infections due to the respiratory syncytial virus, another paramyxovirus.[12]

OTHER DRUG OF ANTIVIRAL

The other drug of antiviral for questionable efficacy of ribavirin and/or chloroquine and the severity of NiV infections in people a 36 amino acid HR2-based fusion inhibitor (Niv-Fc2) analogous to the approved HIV-specific therapeutic peptide enfuvirtide, has been proposed as a specific therapy against Henipaviruses.[12]

BIOLOGICAL

Convalescent Plasma

The current outbreak of pathogen such as Ebola virus disease or Middle East respiratory syndrome coronavirus, have renewed attention to convalescent plasma and immunoglobulin. There is no treatment with a proven record of safety and efficacy is available in case of severe disease and it may appear as the only available therapeutic option.[12]

Monoclonal Antibodies

The targeting of monoclonal antibodies is the surface glycoproteins of HIV have shown efficacy against both HIV and NIV as pre and post-exposure prophylaxis in animal models, but before the onset of clinical signs these antibodies must be administered, they are unlikely to be useful for treating symptomatic patients, while probably beneficial for post-exposure prophylaxis in potentially exposed individuals.[12]

HOST-DIRECTED INTERVENTIONS

Immuno Modulators

The NiV infection is the innate immune response of thought to alter the pathogenic process that is induced, offering the option of a therapeutic approach based on immune modulation. A synthetic derivation of polyinosinic: polycytidylic acid (poly-IC 12U or Rintatolimod), an analog of double-stranded RNA which strongly activates IFN production, has been shown effective in limiting disease and increasing survival of NiV-infected hamsters. When the administration of 3 mg/kg of body weight daily from the day of infection to 10 days post infection to prevent the mortality in 5 of 6 infected animal.[12]

Adjunctive Therapeutic

The other severe diseases of viral origin, aggressive supportive care may help to improve patient survival. Especially in Bangladesh, NiV infection is associated with respiratory disease and respiratory failure. When the transfer of ICU patient the essential for oxygen supplementation is the part of the management guidelines of this infection.[12]

TREATMENT

Currently, no drugs and vaccines are available to treat the Nipah virus. The main approach of this condition to treat the symptoms and managing the infection based on intensive supportive care. Ribavirin used to alleviate the symptoms of nausea, vomiting, and convulsions treatment mostly focused to reduce the fever and neurological symptoms. Critically ill individuals need to be hospitalized and may be required to use a ventilator. The human monoclonal antibody of passive immunization used to targeting the Nipah G glycoprotein has been evaluated in the post-exposure therapy in the ferret model and is found to be beneficial.[13]

SUPPORTIVE AND GENERAL MANAGEMENT

- Isolation to the patient in a separate unit.
- Nursing Barriers: e.g. personal protection using masks, gloves, gown and shoe covers.
- Before and after handling/visiting of the patient to do hand washing with soap and water.
- Resuscitation: Airway, Breathing, circulation.
- Care of unconscious patients to the posture change, care of eye, bladder, bowel, and mouth.
- If any respiratory difficulty to give O2 inhalation
- The Nutritional support for oral/NG tube feeding according to the condition of the patient.
- To be Maintain fluid and electrolyte balance (adults: 5% DNS, children: 5% DNS, half or quarter strength saline)
- Fluid restrictions for 30% restriction particularly in children. 2/3 of the daily maintenance can be given in children if the child is not in shock.
- To Maintain intake output chart.
- Bronchodilators may be given through large spacers.[14]

SYMPTOMATIC TREATMENT

Treatment for Fever

Paracetamol – 15mg/kg/dose or 500mg for adult if temperature >101.3oF (not more than 24 hours)

Treatment for Convulsion

(i). If a patient present with convulsion:

- Adult: IV diazepam 10mg stat.
- Children: per rectal diazepam 0.5mg/kg (maximum 10mg)as start dose.
- It can be repeated once again after 10min

(ii). If seizures persist despite the above measures, treat as status epilepticus

(iii). If presents with phenobarbitone (adult: 60 mg BD, children: 5mg/kg/day BD)

Treatment of Raised Intracranial Pressure (i.e. bradycardia, hypertension, papilloedema and deterioration of consciousness)

i. Elevation of head up to 30 degrees with straight head

ii. Mannitol

- Adult – 200ml IV running stat and 8 hourly until features of raised ICP resolved or not beyond eight doses of mannitol.
- Children – 2.5 – 5 mg/kg over 20 minutes as bolus does stat and 6 hourly, not beyond eight doses of mannitol

Treatment for Hypoglycemia(<40 mg/dl)

- Adult: 25% glucose – 40ml IV
- Children:10% glucose 5ml/kg bolus and can be repeated if necessary.

Treatment for a Shock

i. 0.9% Normal saline:

- Adult: 1 litre in the 1st hour
- Children: 20 ml/kg over 20 mins

ii. Dopamine (when needed):

- Adult: 05 – 20 microgram/kg/min
- Children: 5 – 10 microgram/kg/min[14]

OTHER TREATMENT

- Antibiotic e.g. IV ceftriaxone (children: 100 mg/kg once daily, adult: 2 mg BD for 10 days in a suspected case of bacterial meningitis
- IV acyclovir 10 mg/kg 8 hourly as an infusion over 20 min for 10 days.
- The Broad spectrum antibiotics+ metronidazole/clindamycin (for aspiration pneumonia/secondary bacterial infection)
- Antimalarials according to the national guideline[14]

CRITERIA FOR TRANSFORMING PATIENT TO ICU

Signs of Impending Respiratory Failure

- Respiratory rate: adult: >30/min, children: >70/min
- O2 saturation <90%
- Central cyanosis

Despite breathing in oxygen 5 litres/min through a mask.

In children, severe chest indrawing _ is also important.

- Uncontrolled seizures
- GCS< 8
- Hemodynamic instability
- Multi-organ failure[14]

Criteria for Referral to Higher Centre

- Deteriorating level of consciousness
- Uncontrolled convulsion
- Worsening Respiratory distress
- Uncontrolled Haemodynamics instability[14]

Care During Transportation of the Patient

Maintaining patient airway

- Lateral position
- Airway suction if required
- Oxygenation

Oxygenation

Monitoring during transport

Personal protection for the person related to transport[14]

Requirement for an Isolation Room

- The standard should be equivalent to High dependency unit
- To be Switch on the Exhaust fan
- Separate the pulse oximeter, Noninvasive BP, stethoscope, BP machine, Thermometer, torchlight.
- To be Supply the adequate disposable glove, gown, surgical mask/N95 mask, hand washing facilities, chlorhexidine hand washing solution

One mechanical ventilator for each four bedded HDU

- HME filter
- Close circuit section apparatus[14]

Monitoring and Follow Up

- Higher psychic functions – intact/impaired
- Orientation (time, place, person) fully oriented/impaired
- Speech - interact /impaired
- Swallowing – interact/ impaired
- Seizure – controlled uncontrolled
- Motor activities – upper limb – power, coordination
- Lower limb – power, coordination, gait
- Daily activities (feeding, dressing, washing, bathing) – fully independent, partially dependent, fully dependent[14]

PROGNOSIS OF NIPAH VIRUS INFECTION

The prognosis of Nipah virus infections is far too poor. According to the World Health Organization fatality rate is estimated) to range from 40% - 75% depending upon the local capabilities for surveillance and clinical management (supportive care). The Survivors virus may have residual neurological problems such as seizures and/or personality changes. A few survivors who recover may subsequently relapse or develop delayed-onset encephalitis.[3]

EARLY DETECTION AND CLINICAL MANAGEMENT OF NIPAH VIRUS INFECTED PATIENTS

Early Detection

The early detection of Niv proactively to detect new cases, Prompt to management, Prevention of transmission including human to human transmission.[15]

Recent Kerala Outbreak

One index case and 18 confirmed cases (12 male cases and 7 female cases), The clinical presentation – encephalitis ARDS or myocarditis, One patient had an only fever, headache, tiredness, cervical adenopathy, Two survivors – different spectrum, Myocarditis, encephalitis, ARDS and dysautonomia, Ful like illness.[15]

Clinical Features

Fever, profound tiredness, headache, vomiting, disorientation, breathlessness, cough, diarrhea, convulsion/myoclonic jerks.[15]

Information to be Collected

Information's are collected from Demographics, presenting symptoms of illness, exposure to ill patients, exposure to animals in the surrounding area, and other possible risk factors like hospitals visits, the degree of contact with the patient, and type of barrier precautions and used during patient care.[15]

Early Detection-Implications

Early initiation of management, Training of health care workers, preventions of transmission, excluding treatable causes, effective implementation of a triage system.

Case Definitions

Adapted from NCDC interim guidelines, WHO Bulletins, updated 23..5.2018 DHS, if suspected Nipah case, person from a area/locality affected by a Nipah virus diseases outbreak who has: Acute fever with new onset of altered mental status or seizure and/or, acute fever with new onset of altered mental status or seizure and/or. Acute fever with a severe headache and or, acute fever with cough or shortness of breath.[15]

Probable Nipah Case

Suspect case-patients who are resided in the same village where suspect or confirmed case of Nipah was living during the outbreak period and who died before complete diagnostic specimens could be collected (OR) suspect case-patient who are coming in direct contact with confirmed case-patients in a hospital setting during the outbreak period and who died before complete the diagnostic specimens could be collected.[15]

Confirmed Nipah Case

After confirmation of laboratory Suspected case of Nipah Virus infection Or Nipah virus RNA identified by PCR from respiratory secretion, urine or cerebrospinal fluid. To Isolate of Nipah virus from respiratory secretions urine or cerebrospinal fluid.[15]

Definition of a Contact

A close contact as a patient or a person who is coming in contact with a Nipah case (confirmed or probable cases) in at least one of the following ways. We admitted simultaneously in a hospital ward or shared room with a suspect or confirmed case of Nipah virus infection or disease. Has had direct close contact with the (decreased) suspect or confirmed case of Nipah virus disease at a funeral or during burial preparation rituals. If who are all touched the blood or body fluid (saliva, urine, vomitus, etc) of a suspect or confirmed case of Nipah virus disease during their illness and has touched the clothes or linens of a suspect or confirmed case of Nipah virus disease.[15]

Investigations

Baseline, specialized, ABG, Trop I, which sample – eg: CSF, other body fluids and tissues, imaging including POCUS, MRI, ECHO and ECG. Excluded other causes of definite treatment like blood, urine, throat swab and CSF – Nipah RNA RT PCR.[15]

Standard Care of Encephalitis

Patient with increased ICP: The Management of fever, pain, control of cough and other strains. Prevention of seizures, control of systemic hypertension, elevate head, furosemide 20mg IV or mannitol1-2 mg/kg IV over 30-60minutes provided circulatory volume is protected hyperventilation – PaCO2 – 30mmhg.[15]

Seizures: To give Lorazepam 4mg IV, phenytoin 100mg IV q6-8h, fosphenytoin 150PE q8h IV, levetiracetam 500mg q8 – 12hr IV.[15]

Standard Care of Myocarditis

The Supportive therapy of symptoms of acute heart failure with the use of diuretics, nitroprusside and ACE inhibitors.

Inotropes: To give Dobutamine – 2 to 5 micrograms/kg/min, titrated up to 20micrograms/kg/min – inotrope and potential vasodilator, lowers blood pressure; give as an individual agent as long as systolic blood pressure(SBP) greater than equal to90. Can use with dopamine. To give Dopamine- 3 to 5 micrograms/kg/min, titrated up to 20 – 50 microgram/kg/min as needed –inotrope and vasoconstrictor, increased left ventricular end diastolic pressure and causes tachycardia. Can use with Dobutamine give Norepinephrine-2 micrograms/min titrate to response- vasoconstrictor and inotrope; preferred as a single agent over Dobutamine SBP<70. Can use combined with dobutamine.[15]

Standard Care of ARDS

Severe ARDS is often associated with refractory hypoxemia, and early identification and treatment of hypoxemia are mandatory. For mechanical ventilation specific settings are recommended; limitation of tidal volume (6 ml/kg predicted body weight) adequate high PEEP (12 cmH_2O) a recruitment maneuver in special situations, and a balanced respiratory rate (20-30/min). Because incubation and mechanical ventilation may be associated with an increased incidence of complication such as barotrauma and nosocomial pneumonia, alternatives to mechanical ventilation such as a high-flow nasal cannula or noninvasive positive-pressure ventilation (NIPPV) may be beneficial in patients with ARDS. So for mild and moderate ARDS, NIV stands as the first-line approach. A patient who has a diminished level of consciousness, vomiting, upper GI bleeding, or other conditions that increase aspiration risk are not a candidate for NIPPV. Other relative contraindications include hemodynamic instability, agitation

and inability to obtain good mask fit.[15]

SPECIFIC TREATMENT

Ribavirin

To start dose 2g stat, 1g 6 hourly 4 days followed by 500mg 6 hourly for 5 days (based on WHO guideline for other haemorrhagic fever and started on confirmation of Niv, Ribavirin has a broad activity against RNA and some DNA viruses, Experiences of -HCV hemolytic anemia, teratogenicity, dose 400mg twice daily, Used in Malaysian outbreak is the open-label trial -36 % reduction in mortality, animal models further proved effectively.[15]

Favipiravir

Purine analogue, Effective in a Syrian hamster model-twice daily oral or once daily SC for 14 days, Has an efficacy against broad spectrum of RNA viruses , Approved for the use in Japan in emerging influenza strain, the Recommended dosage and schedule of influenza antiviral medications for treatment in Japan (as of 2016), 1600 mg twice daily as initial dose, 600mg twice daily for following 2-5 days Oral,There is no recommended in chemoprophylaxis.[15]

MONOCLONAL ANTIBODY M102.4

To Recognize the G envelope protein of NIV, appears to block the receptor binding site on the protein, Preventing adhesion to the Ephrin B2 protein and Thereby inhibiting the viral entry into the host cell.[15]

Protocol for the Ventilator Management of Patient with Acute Lung Injury (Ali)/Ards

Indications for Mechanical Ventilation

Severe Respiratory failure: Failure to achieve oxygen saturation of > or equal to 90% (or pO2 of > or equal to 60 mm Hg) on an FIO2 < 0.6.

Ventilator Settings

Pressure pre-set (controlled) Low tidal volume ventilator support. Tidal volume -6 ml/kg ideal body weight (respiratory rate to a maximum of 30-35 per minute.

Open lung strategy of ventilation with PEEP titration to keep the lung recruited to achieve an FIO2 of < 0.5 and a saturation of 90% or a PaO2 of > 60 mmHg. Additional use of recruitment maneuver is mandatory to ensure prevention of plateau (Pause) pressure not to exceed of >30-35 mmHg.

Alternative modes of ventilation APR (Airway Pressure Release Ventilation), IRV (Inverse Ratio Ventilation) in Patient with persistent Hypoxemia (SPO2 of < 88-90% with high PEEP or FIO2 > 0.8.

Rescue therapy – one position ventilation, permissive hypercapnia or high-frequency ventilation can be considered if above oxygen goal is not me.

If Non-Invasive Ventilation for respiratory support is to be considered, it is mandatory to use a non-rebreathing mask with the use of inspiratory and expiratory tubes through a critical ventilator to reduce the spread of infection aerosol. Use of HEPA filters to expiratory ports of the ventilator circuit / high flow oxygen masks is recommended.[10]

PREVENTION OF NIPAH VIRUS

The public should adopt these following measures to reduce the risk of infection when traveling to affected places by Nipah virus.

- To avoid contact with both farm or wild animals, especially bats and pigs.
- To maintain these type of good personal hygiene properly like wash the hand frequently with liquid soap and water, especially after contact with animals or their droppings/secretions and taking caring or visiting sick people also.
- To observe the good food hygiene for fruits should be wash and peel thoroughly before the consumption.[2]

1. Mainly the prevention to focus on immediate eradication by the mass culling of infected and in-contact pigs.

2. After the culling, of the burial sites, are disinfected with chlorinated lime.

3. To Use sodium hypochlorite (bleach) to disinfection of the contaminated areas & equipment

4. Strictly tot Ban on transporting pigs within the countries affected a temporary ban on pig production in the regions affected, e. Improvement of biosecurity practices

5. To give the Health Education and use of personal protective equipment (PPE) by persons exposed to potentially infected pigs is highly recommended.

6. Improved hygiene at pig operations is suggested.[3]

REDUCING THE RISK OF INFECTION IN PEOPLE

Bat-Human Transmission

To decrease bat access to date palm sap and other fresh juice and food product. Before consumption of collected date, palm juice should be boiled and fruits should be thoroughly washed and peeled.

Animal-To-Human Transmission

To use the protective glove and clothing should be worn while handling sick animals or their tissues and during slaughtering and culling procedure. To avoid being in contact with infected pigs.

Human To Human Transmission

After contact of the infected animal should wash the hand regularly with full personal protective equipment.[16]

NIPAH VIRUS COMPLICATIONS

The complications of Nipah virus contain:

- Acute respiratory infections causing interference in breathing
- Seizures
- Encephalitis
- Mental confusion and disorientation
- Atypical pneumonia
- Brain swelling or fatal encephalitis
- Progression to a state of coma within 24 to 48 hours.[17]

DISCUSSION

Yu J et al (2018)

Conducted the study to describe the route of transmission of the Nipah virus in different countries & analyses the possibility of the primary disease being china & method of the transmission of China.

The aim of the study to improve people risk awareness & control of the disease & reduce the risk of occurring & spreading in China.[18]

Mehand MS et al (2018)

The committee determined that, given their potential to cause a public health emergency and the absence of efficacious drugs and\or vaccines, there is an urgent need for accelerated R&D for (in no order of priority) Crimean-Congo Hemorrhagic fever, Ebola virus and Marburg virus disease, Lassa fever, middle east respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS), Nipah and Henipaviral diseases, rift valley fever and Zika virus disease. This report describes the methods and results of the 2018 prioritization review.[19]

Nahar N, et al (2015)

Conducted the study to aim to understand date palm sap consumption habits of rural residents and factors associated with consumption. Finally implementing strategies to increase awareness about the risks of NiV transmission.[20]

Bhatia R, et al (2010)

Conducted the study of diseases transmitted from animals have assumed substantial public health importance. & it can cause huge economic losses in addition to mortality and morbidity. Finally, they are found a clear need for greater awareness and application of a multi-sectoral and multidisciplinary approach to prevent and control zoonotic infections.[18]

Van Der Poel WH, et al (2006)

Conducted the study to assess future threats posed by zoonotic viruses of bats, there is a need for accurate knowledge of the factors underlying disease emergence, for an effective surveillance program, and for a rapid response system. A study performed to assess the public health hazards of such viruses (i.e., infectivity and risk of infection of people) finally the found the public health awareness of emerging zoonotic viruses of bats.[21]

CONFLICTS OF INTEREST

We hold that we have no conflicts of interest with any consistency.

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