Kyasanur Forest Disease – First Reported Case in Kerala

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Abstract
Kyasanur Forest disease is a tick-borne arboviral fever with biphasic course of illness with prominent hemorrhagic features in the first phase and encephalitic picture in the second phase. So far it has been described in the southern Karnataka only. Here we report a case of Kyasanur Forest Disease for the first time from Kerala in an 18 year old male from Noolpuzha – Alathoor colony of Wayanad district.

Introduction
Kyasanur forest disease (KFD) is caused by Kyasanur Forest Disease Virus (KFDV), a member of the virus family Flaviviridae. KFDV was identified in 1957 when it was isolated from a sick monkey from the Kyasanur forest in the Karnataka (formerly Mysore) State, India. This case is not so far reported from Kerala.

Case Report
Our patient was an 18 year old male from Noolpuzha – Alathoor colony of Wayanad District at Karnataka Border, who was admitted with high grade fever of 9 days duration. He had associated bifrontal mild headache, sore throat, conjunctival congestion with mild discharge and oral ulcers. On 3rd day after admission, he developed altered behaviour, loose stools and occasional vomiting. He had associated cough with scanty sputum and yellowish discoloration of urine also. There was occasional hemoptysis and passage of black stools. There was no history of loss of consciousness, seizures, weakness of limbs or altered sleep pattern. There was no history of dyspnoea, syncope, chest pain, dysuria or reduced urine output. There was no history of travel outside Kerala. As he was residing in a forest area, he used to get exposed to tick bites.

On examination, he was drowsy with mild disorientation. Conjunctiva was congested and there were multiple oral ulcers. There were few small posterior cervical lymph nodes. There was no icterus, clubbing or pedal edema. His pulse rate was 68/minute, blood pressure was 100/60 mm Hg in the right upper limb, respiratory rate was 24/minute and he was febrile. Nervous system examination showed hypotonia of all limbs, sluggish deep tendon reflexes and bilateral extensor plantar. There was no cranial nerve involvement, weakness of limbs or cerebellar signs. There was no hepatosplenomegaly or ascites. Respiratory and cardiovascular system examination was within normal limits. Initial possibilities considered were scrub typhus, viral encephalitis, Cerebral malaria and Typhoid fever.

Investigation showed haemoglobin 14.3 g/dl, total count 4600/µl with a differential count P 52% L30% Mx17%, platelet count 40000/ µl, MCV 82 fl and ESR 80 mm/1st hour. Total count done in the first week of illness, before coming here was 1700/µl. Liver function tests showed total bilirubin 2 mg/dl, indirect bilirubin 0.9 mg/dl, SGOT 1313 IU/L, SGPT 824 IU/L with normal ALP and prothrombin time and INR. Widal and Weil felix tests were negative and blood culture was sterile. Peripheral smear showed reactive lymphocytes with no parasites seen. CSF study was normal, EEG showed diffuse cerebral dysfunction and MRI Brain showed temporoparietal altered signal intensities. Meanwhile he was started on Acyclovir, Doxycycline and Ceftriaxone. He became afebrile the third day and sensorium also improved. Meanwhile results of blood sample on the first week of illness came as positive for Kyasanur Forest Disease by viral PCR from National Institute of Virology, Pune. Referring back the history there were few monkey deaths reported in the locality. He became febrile again in the second week of admission showing a characteristic biphasic nature of illness. A final diagnosis of KFD was made with the characteristic clinical picture and PCR.

Discussion
Kyasanur Forest Disease first reported in 1956 in Shimoga District of Karnataka. It is tick-borne disease caused by Haemaphysalis spinigera.

Monkeys become infected with KFDV through the bite of infected ticks; the virus is then transmitted to other ticks feeding on infected monkeys. KFDV infection causes severe febrile illness in some monkeys. When infected monkeys die, ticks drop from the body, thereby generating hot spots of infectious ticks that further spread the virus. In the enzootic state, KFDV circulates through small mammals (e.g., rodents, shrews, ground birds) and ticks (Figure 1).

Larval population builds up in the monsoon months but remains dormant under the forest litter and becomes suddenly active when the litter dries up during the post-monsoon months - October to December. Nymphal activity is high from January to May. Epidemics coincide with nymphal activity; hence nymphs are considered as the most important stage for human transmission.

Heavy mortality in two species of monkeys viz. the black faced langur (Semnopithecus entellus) and the red faced bonnet monkey (Macacaradiata) in March 1955 in the forested areas of Shimoga district, Karnataka State led to the discovery of the disease. The mortality in monkeys was followed by high incidence of acute prostrating febrile illness and a few deaths among the villagers in the neighborhood. Investigations resulted in the isolation of the virus from monkeys, man and ticks. The disease was named after the forest area where it was first discovered.
Fig. 1: Life cycle of KFD virus with seasonal incidence of KFD

as Kyasanur Forest Disease (KFD) and the virus was named as KFD virus. KFD is unique to five districts (Shimoga, Chikkamangalore, Uttara Kannada, Dakshina Kannada, and Udupi) in the Malnad region of Karnataka State, India, where each year during January–May, 100–500 persons are affected by the disease. Wayand is only 250 km away from most of these locations and the person belonged to an area at the Karnataka border.

Clinically, KFD symptoms at onset in human are sudden chills, high fever, frontal headache, heightened sensitivity to light, followed by continuous fever for 12 days or longer often associated with diarrhea, vomiting, cough, severe pain in the neck, low back and extremities, accompanied by severe prostration. Papulo-vesicular eruption on the soft palate (blisters on the upper, inner mouth) is an important diagnostic sign in some patients. Bleeding signs such as in the gum, nose (epistaxis), cough (hemoptysis), gastrointestinal bleeding resulting in dark feces (melena) or fresh blood in the stools are common. The incubation period is of 2-7 days. The convalescent phase constituting the recovery after KFD’s onset is generally prolonged, maybe up to 4 weeks. Relapse of the symptoms, often observed after 1 to 2 weeks of the first febrile period, last for 2 to 12 days. The relapse phase displays same symptoms as the first phase and in addition symptoms such as mental disturbance, giddiness and reflex abnormality are often seen.3

Leucopenia (reduction in the number of white blood cells) and accompanying thrombocytopenia (reduction in the number of blood platelets) are constant hematological features in KFD. Intraalveolar haemorrhage (oozing of blood into the lungs), resulting in secondary infection and massive gastrointestinal haemorrhage are terminal complications that could lead to death.

Diagnosis is primarily syndromic and serological. Being a very stable virus in the blood, isolation of KFDV from patient’s serum can substantiate the clinical diagnosis of KFD. So far, no rapid diagnostic kit is available, thus precluding early diagnosis. Nor is there any specific treatment regimen available for KFD patients. A timely supportive therapy, such as careful precautions for patients with bleeding disorder and maintenance of hydration, is important. Mortality is 4-15% primarily by hemorrhagic diathesis. National Institute of Virology (NIV) has developed an inactivated chick embryo tissue culture vaccine against KFD. This vaccine evokes neutralizing antibodies response in about 70% of the vaccinated persons.

To conclude, as this is the first time KFD is reported in Kerala, we should watch out for presence of this disease in patients who come from similar epidemiological setting. Wayanad has dense forests with probably lots of tick population and there is likely chance of spread of this disease from Karnataka to Kerala because of the close proximity geographically.

References