

A COMPARATIVE STUDY ON THE EPIDEMIOLOGICAL ANALYSIS OF KYASANUR FOREST DISEASE AND IT'S RELATIONSHIP ON THE LIVELIHOOD OF TRIBES IN WAYANAD DISTRICT, KERALA

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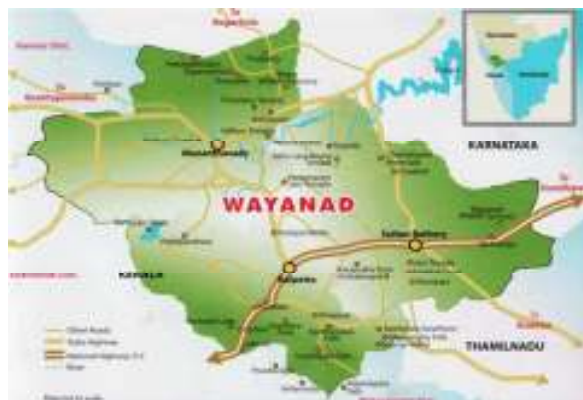
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ABSTRACT

This disease is caused by a virus of *Flaviviridae* group which is having its natural cycle between the ticks of *Haemophysalis spinigeriae* and the wild animals like monkeys, shrews, rodents, small birds, spilling over to domestic animals like cattles, buffalos, goats, dogs etc., which graze in the infested forests, and humans are accidentally infected by the bite of the infected ticks. The As far as Indian scenario is concerned the KFD has affected badly among the untroddentribes and gothras commonly called *aadhivasi* who are far behind the pace of development and science, in the Wayanad district, Kerala. The methodology adopted was open ended schedule technique, in which interview was carried among 100 tribal families, randomly selected from 86 Kattunayakka and 78 Panniya communities of Poothadi Gramapanchayath, Cheeyambham 73 Colony, Wayanad, Kerala. The study revealed: 87 percent of the forest based tribal workers wear minimum clothes; 74 percent does not use footwear; 96 percent failed to use gloves and 88 percent does not use anti-tick repellents, which made them prone to the disease. The domesticated- forest roaming dogs carries ticks and spread among the family.

KEYWORDS: Kyasanur Forest Disease (KFD), Tribes, Wayanad

Kyasanur forest disease (KFD), commonly known as Monkey Fever, is one of the re-emerging viral hemorrhagic fever, affecting primarily the monkeys and other wild animals which was first reported in the year 1955 from the Kyasanur forests of Shimoga district in Karnataka (Telford, 1957). Since then, the disease has spread to larger areas surrounding this forest land, and has affected southern region of the Western Ghats into which Kerala state belongs.



The causative agent is *Flaviviridae* group which is having its natural cycle between the ticks of *Haemophysalis spinigeriae* and the wild animals, spilling over to domestic animals which graze in the infested forests, and humans are accidentally infected by the bite of the infected ticks. KFD has a clear seasonal pattern coinciding with the life cycle of the ticks, with epidemic

proneness during the pre-monsoon months of January to May. People who reside deep inside the forests, forest personnel, picnickers, and adventure tourists are at high risk of getting infected if protective measures are not used.

In Wayanad district, Panchayaths such as Poothadi, Mullankolly, Pulpalli, Panamaram, Cheethalayam and Noolpuzha are more prone to the KFD (Priya *et.al.*, 2016) and several deaths due to the disease has been reported during summer in the recent years. Confirmed cases from the Alathur tribal colony under Noolpuzha PHC area of Wayanad district in April 2013 and the second incident occurred among a group of 6 women who were working under the Mahatma Gandhi National Rural Employment Guarantee (MGNREGA) program, and belonged to the same colony, one-year later, in March 2014 set up on the disease chain in Kerala. The first human sporadic case of KFD was reported in the Wayanad district with 9 deaths and 184 cases (Abiliyababu and Jayakrishnan, 2015). Two positive cases of KFD have been reported in various parts of Wayanad district recently- seven cases from the Cheeyambam tribal hamlet in Pulpallygrama Panchayat and one each from Padinharethara, Periya and Poothadi gramapanchayaths Internationally, KFD virus is ranked as one of the highest risk categories of pathogens belonging to Bio Safety Level-4 (BSL-4) for other countries and a group 3 risk pathogen for India. KFDV is regarded as a potential bio warfare agent (Borio, 2002). The present study was undertaken to show light towards the aspect that

the KFD is prevalent among the tribes residing near the forest, whether the prevalence of KFD has got any association with the tribal livelihood, social health awareness and life style.

MATERIALS AND METHODS

The methodology adopted was open ended schedule technique, in which interview was carried among 100 families which were randomly selected from the 86 Kattunayakka and 78 Panniya tribal family communities of the Poothadi Gramapanchayath, Cheeyambham 73 Colony, one of the most disease prone tribal communities in Wayanad District.

RESULTS AND DISCUSSION

The study revealed that 87 percent of the tribes engaged in forest based works including firewood collection wear minimum clothes, exposing their body; 74 percent tribes does not use footwear such as waders and other coverings; 96 percent of them failed to protect their hands using gloves and 88 percent of the tribes does not apply anti-tick repellents to get protection from the vectors. The domesticated dogs become carriers of these vectors due to their free roaming nature during day hours going to the infested forest and returning back with ticks. The dogs will socialise with the family members and be in their home during night hours spreading the ticks to those family members. Negligence showed by the tribes towards the vaccination against KFD is another drawback for the spread of disease and is due to their lack of awareness.

On the basis of community health, the ever increasing incidences of Monkey fever is of utmost importance because the minor hot spot of KFD in Shimoga district in 1955 has expanded to a larger area over the previous years. The disease is manifested among the primitive tribal groups, who are deprived of many basic needs for a living. The remoteness of the affected people results in late detection, and prevention. Vaccination of the high-risk groups also becomes difficult due to the remote locations. Spilling over of the infected monkey population into human habitations can aggravate the situation further. The whole eastern highlands of Kerala being a continuous zone of the Western Ghats, the virus can slowly spread to the whole of this state in a distant future, if early and effective measures to control are not implemented. The confirmation based on the molecular diagnostic tool showed an increase in the prevalence of the disease. KFD thus becomes another example of man-animal-environment interface with a delicate balance between well-being of each other, with potential for the explosion

on slightest disturbance. One Health Initiative has a great role to play in maintaining this balance. The COHEART Center situated in a strategically advantageous district, can collaborate with the Shimoga center for KFD surveillance among wildlife, domestic animals, tick incrimination and thereby identification of hot spots, and also track the geographical expansion of the virus.

In monkeys, KFDV causes acute febrile illness, haemorrhagic enteritis (Bhat, 1991). KFDV has a genomic organization consisting of a single-stranded RNA molecule of nearly 11 kb encoding a polyprotein which is cleaved into three structural and seven non-structural proteins (Chambers *et al.*, 1990). When infected monkeys die, ticks drop from the body, thereby generating hotspots of infectious ticks that further spread the virus. Humans have an incubation period of 3-8 days followed by chills, headache and high fever for 3-4 days. After the onset of initial symptoms there could be severe myalgia, cough, diarrhoea, vomiting, photophobia and bleeding problems. Papulo-vesicular eruption of the soft palate is an important diagnostic sign in some patients. Bleeding signs from gums, nose, in sputum, bleeding from gastrointestinal tract resulting in dark faeces (malena) and fresh blood in the faeces are commonly seen. Cervical and axillary lymph nodes are usually palpable. After 1-2 weeks of symptoms, some patients recover without complication. The convalescent phase after the onset of disease is generally prolonged almost up to 4 weeks. Relapse of the symptoms, often observed after 1 to 2 weeks of the first febrile period, lasts for 2 to 12 days. During infection by KFDV, the virus titre remains high for 10 days after onset of symptoms (Devendra *et al.*, 2013). The unawareness among the tribes about the disease symptoms has resulted in the failure of proper medication and containment of the disease. The tribes restrict with traditional herbal medicines, the effectiveness of which is limited and has had yet to be studied. The hesitation among the tribes to visit the primary health centre for their ailments and lack of facilities to diagnose the disease has resulted in the greater spread among the set of tribal people.

Vaccination of villagers and forest workers proved to be very effective in preventing the disease. For prevention and control of KFD vaccination with formalin-inactivated tissue-culture vaccine has been the primary approach. The Vaccines based on inactivated viruses as antigens have shown a certain level of adverse reactions, especially in children, and this has to be carefully balanced with their efficacy and durability (Dandawate *et al.*, 1994) The current vaccine strategy used in India includes a two-

dose vaccine at an interval of one month. The initial series is followed by a booster at 6–9 months and subsequent boosters every 5 years (Sarkar *et. al.*, 1962). The strategy also involves mass vaccination in areas reporting laboratory evidence of KFD activity and in villages within a 5-km radius of such areas. Thus Government authorities should take necessary steps to create awareness among the tribes about the disease, hygienic measures to be adopted and the use of protective among them, who are engaged in forest related activities. It is high time that the university-COHEART Centre should join hands with the Government agencies to establish a strong barrier wall to protect these weakened communities, who are a part of the Nation, without the upliftment of them, the nations' development is senseless. An operative policy must be implemented both at the national and state level to contain the disease and vaccination must be made mandatory among the prone areas, in order to prevent the explosion of the bio-hazard. As in the saying Prevention is better than cure, should be adopted, as it is not late yet.

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