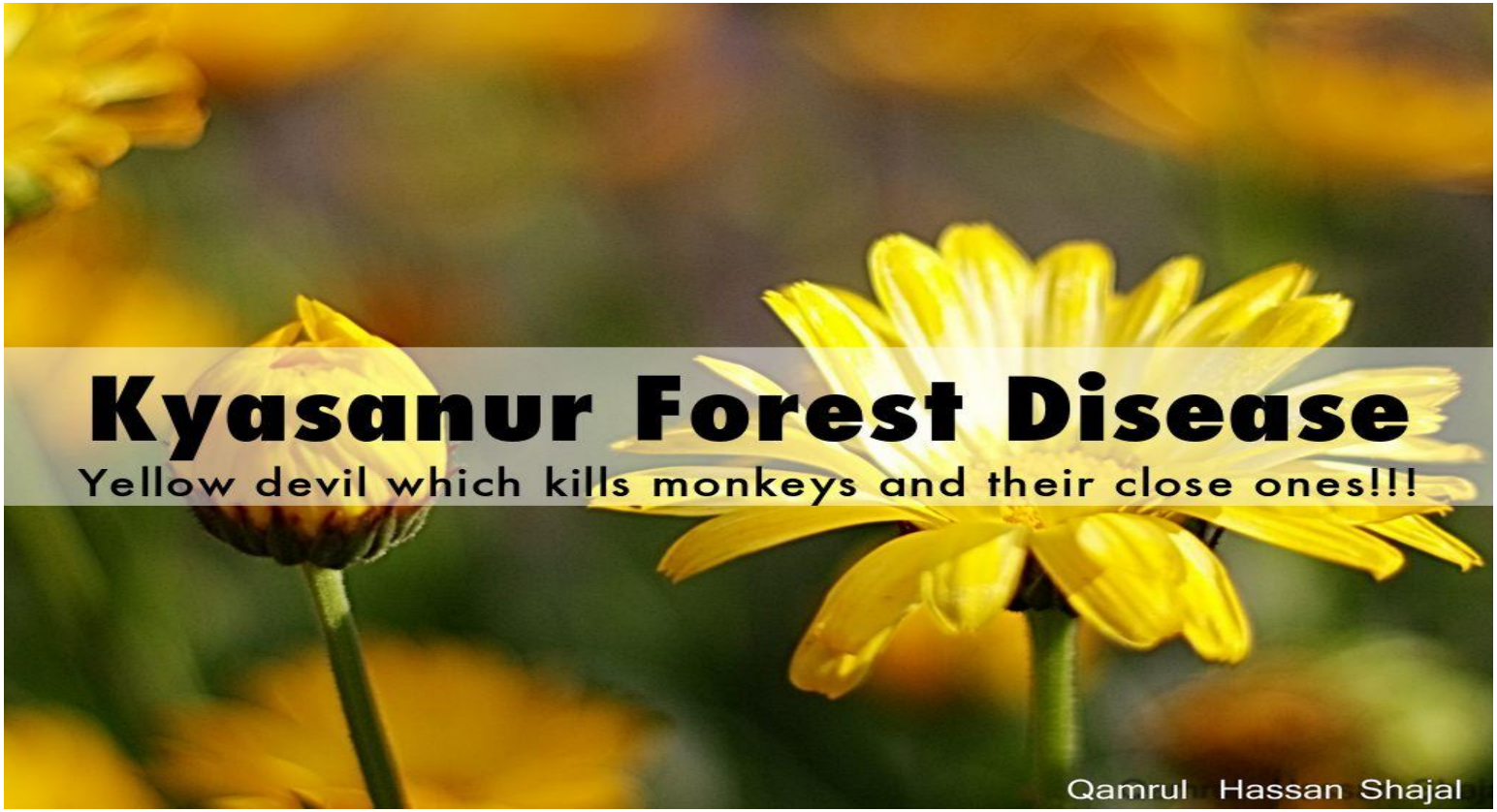
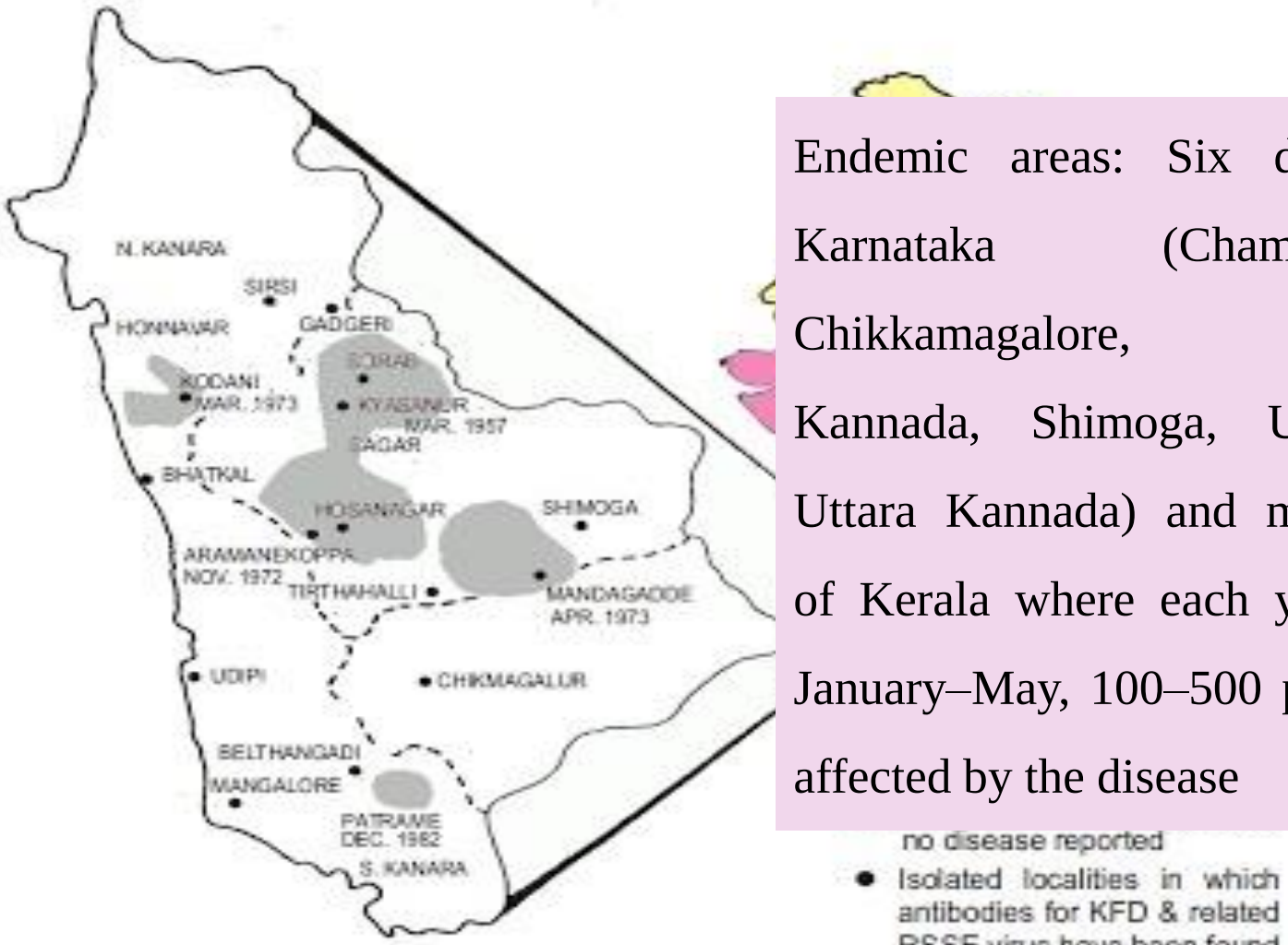


Kyasanur Forest disease (KFD) is a tick borne viral haemorrhagic fever caused by Flavivirus (flaviviridae)

INTRODUCTION



Endemic areas: Six districts of Karnataka (Chamarajanagar, Chikkamagalore, Dakshina Kannada, Shimoga, Udupi and Uttara Kannada) and malappuram of Kerala where each year during January–May, 100–500 persons are affected by the disease

ETIOLOGY

- **Caused by-** Flavivirus (RNA genome)

- It shares the antigenic relationship with
    1. Russian Spring Summer encephalitis
    2. European Spring Summer encephalitis
    3. Louping ill
    4. Omsk haemorrhagic fever

HOST RANGE AND VECTOR

- **Major wild life amplifier**


Macaca radiata


Presbytis entellus

- **In endemic area-** Birds and Rodents play imp role
- **Vector -***Haemaphysalis spinigera* (most prominent), *Ixodes*

❖Ticks carry the virus in the nymphal and adult instars for up to 14 months

Man and domestic animals act as a dead end host

EPIDEMIOLOGY

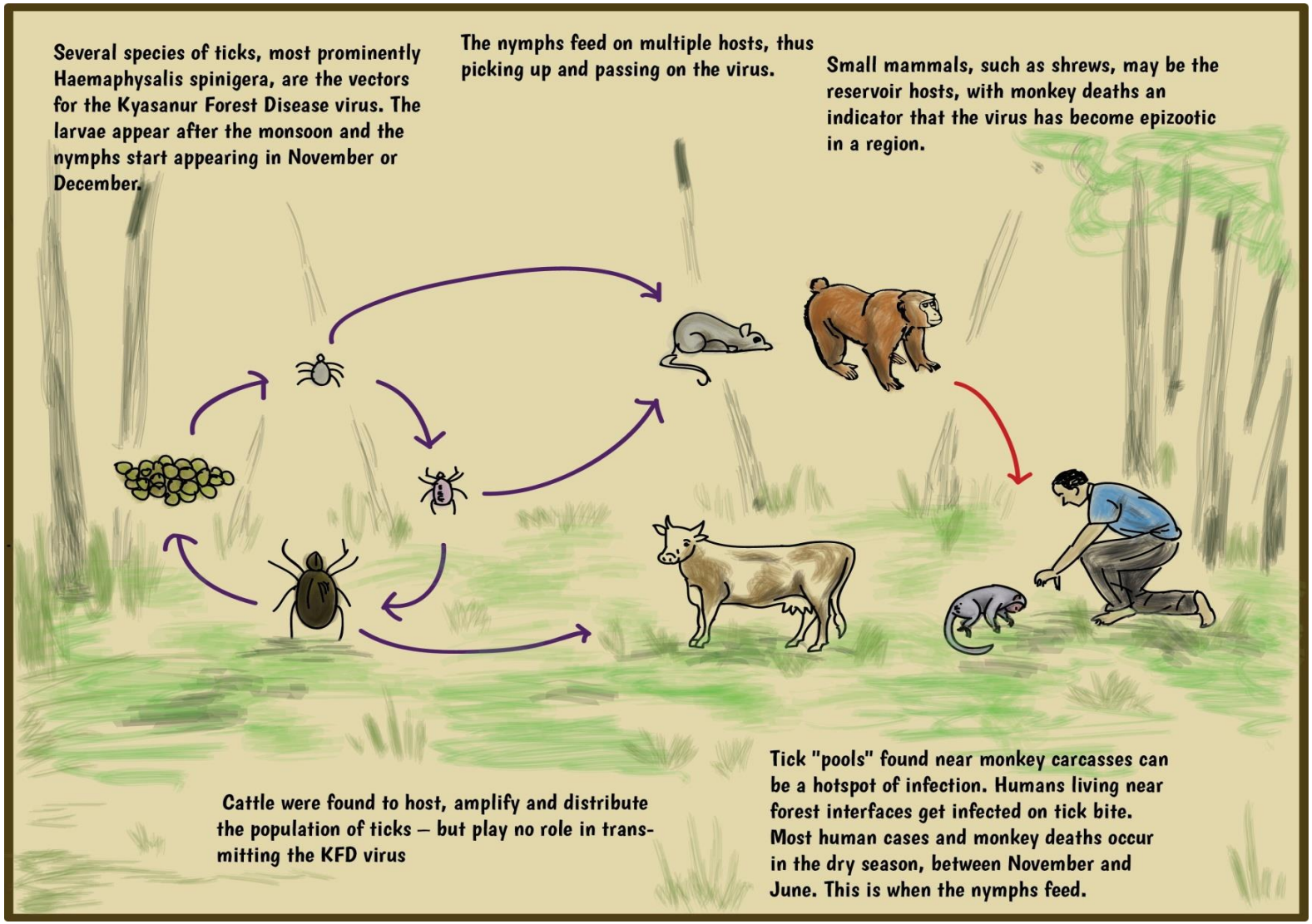
- Season
  - **In Monkeys**-maximum mortality observed during the period of December to may
  - **In human-** maximum cases were reported between the period of January to June
  - Prevalence of disease is low in the rainy season
- Age
  - **Young and adult males** are more commonly affected
- Sex

  Males are more susceptible than female

NATURAL CYCLE

- In enzootic states the infection is maintained in small animals and also in ticks
- When monkeys comes in contact with infected ticks, they get infected, amplify and disseminate the infection in "**hot spots**" of infection
- Humans in these hot spots are infected by bite of infected anthrophilic ticks like *H. spinigera*

TRANSMISSION CYCLE



Viraemic birds play an important role in distant spread of virus and may also carry tick infected with virus

DISEASE IN MAN

- **Incubation period: 3-8 days**
  - Sudden onset of fever, cephalagia, myalgia, anorexia, & insomnia
  - On 3-4 days patient tend to experience diarrhoea & vomiting
  - Papulovesicular lesions on the palate are a consistence findings
  - Hamorrhages: in **poor** & **mal nourished** individuals
  - **Neurological Signs**- neck rigidity, prostration, mental confusion,
  - Gastrointestinal & bronchial problems are common
  - Case fatality rate- **5-10%**

DISEASE IN ANIMALS

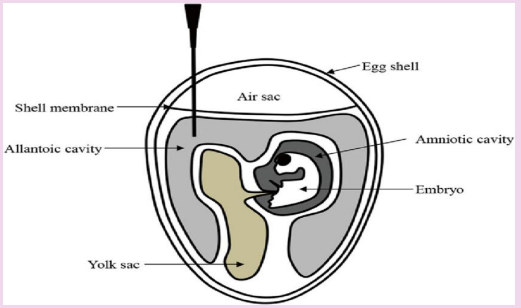
- **In monkey-**
  - Diarrhoea, bradycardia & hypotension
  - In diseased monkeys virus is present-
    - Blood,
    - Liver, spleen, kidney, lung, heart,
    - Skeletal muscles
    - The brain
  - Mortality: during the high viremic stage
  - In **experimental cases-100%** fatality were noticed

DIAGNOSIS

- BSL–3 facility is required for handling and working

- **Samples**: Blood and serum, CSF
  - Isolation: from blood during **febrile period** or
  - Organ samples collected during autopsy

- **Virus isolation**
  - **Cell lines**: BHK–21, Vero E6 cell lines
  - **Animal inoculation**: Embryonated chick cell, In mice



- **Serological Methods**:
  - ELISA
  - CF,
  - HI test
  - Neutralization test

TREATMENT

- No specific antiviral treatment
- Early hospitalization & supportive treatment
- **Supportive therapy-** maintenance of normal blood cell counts, blood pressure

- **Symptomatic treatment**:
  - Pain reliefs,
  - Antipyretics,
  - Blood transfusion,
  - Antimicrobial therapy for secondary infections,
  - **Nervous disorder**: Corticosteroids & anticonvulsants

LABORATORY HAZARDS

- Inhalation of aerosol: most frequent way of acquiring infection
- Other means of transmission includes:
  - Conducting post mortem examination,
  - Accidental parentral inoculation,
  - Spilling out of contents from broken glass wares or
  - Accidental ingestion
- Follow the WHO guideline while shipping of samples for diagnosis

PREVENTION AND CONTROL

- **Prevention strategies such as**:
  - Quarantine,
  - Vaccination,
  - Early diagnosis,
  - Tick control will restrict the entry of virus to new areas
  - Spray insecticides has been recommended in a 50-m radius around a dead monkey
- Other control strategy- wearing protective clothing while handling infectious materials and tick control
- Strictly prohibit the visit to affected forest areas during outbreak time
- If visit is inevitable, use protective clothing's and gum boots to cover the whole body and apply some insect repellent to exposed body part

VACCINATION

- Vaccines against KFDV were initially produced in **Shimoga** district of Karnataka.
- Later, the unit was moved to Bangalore (Institute of Animal Husbandry and Veterinary Biologicals)

- **The first vaccine:** formalin-inactivated, mouse-brain preparation of Russian Spring Summer Encephalitis Virus (RSSEV) by ICMR due to the close antigenic resemblance of KFDV with RSSEV

- ✓ 3- dose schedule at 0, 7 and 42 days , SC

- In 1990s, Formalin-inactivated chick embryo vaccine: Haffkine Institute in Bombay licensed and used in India

  - ✓ 2 doses - one month apart
  - ✓ Age group: 7 to 65 years of age.
  - ✓ Vaccine-induced immunity is short-lived
  - ✓ Booster dose within **6 to 9 months** after primary vaccination
  - ✓ Annual booster doses for 5 years
  - ✓ Vaccine efficacy of 79.3% with 1 dose and 93.5% with 2 doses .

Government of Karnataka:

- The Directorate of Health and Family Welfare, Karnataka, vaccination campaigns:

  Formalin inactivated tissue culture vaccine in endemic districts

  - Villages reporting KFD activity (laboratory-confirmed cases in monkeys and/or humans, or infected ticks), and all villages within 5 km of the affected location are targeted for vaccination

  - If cases of KFD are reported in the area in spite of vaccination during the pre-transmission season, additional vaccination campaigns are conducted