

## Dengue Haemorrhagic Fever

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A SUBJECT OF considerable concern and interest at the moment in Malaysia is the prevalence of the serious condition referred to as dengue haemorrhagic fever which tends to appear in epidemic form in Southeast Asia. Locally, we have long been accustomed to the endemic classical dengue fever, but although there are some features of similarity in the geographic distribution, clinical manifestations and mode of transmission, the recently recognized haemorrhagic form appears to be a different entity.

The WHO recognizing the public health importance of the problem and the progressive spread of the disease in Southeast Asia recently organised a symposium to review the situation and outlined a working definition of these two conditions. In its severe form dengue haemorrhagic fever is characterised by shock and/or gastro-intestinal haemorrhage or death during epidemics and is easy to recognize. But, as in many infectious diseases, there appears to be a spectrum ranging from mild to very severe forms. The milder forms in an epidemic could easily be confused with classical endemic dengue which occurs concurrently, and there is no readily available clinical or laboratory method to differentiate between them. Dengue haemorrhagic fever essentially involves indigenous children although older groups have been affected in Singapore, Calcutta and elsewhere.

Dengue haemorrhagic fever in Southeast Asia is a post-World War II phenomenon and was first reported in epidemic form in Manila in 1953. It has subsequently been reported from Saigon, Bangkok, Singapore, Penang, Calcutta and has spread to other urban areas of Southeast Asia and Pacific

Islands. It has been noted that so far it is restricted to tropical areas with a high *Aedes aegypti* population and where classical endemic dengue has been present for a long time.

If this is a new disease a new infective agent must have been introduced into the region or some change must have occurred in an existing infective agent, the vector, man or his environment. It seems unlikely that environmental and host factors have contributed greatly to the change in the situation although sensitization phenomenon may be responsible for the shock syndrome. It has been suggested that double dengue infections with two dengue virus types may produce a synergistic effect or have resulted in a more virulent strain making its appearance. The likelihood also exists of a mutation leading to the appearance of a new strain of dengue virus. Not many virus isolations have been made in laboratory-confirmed cases of dengue haemorrhagic fever. So far, the viruses recovered have been found to be identical with or closely related to dengue types 1,2,3 and 4 and two Chikungunya viruses, the latter having been previously recorded only from Africa where it causes a mild dengue-like disease. Further work requires to be carried out to determine the exact aetiological agent of dengue haemorrhagic fever.

*Aedes aegypti*, the vector of classical dengue has also been incriminated as being responsible for the transmission of dengue haemorrhagic fever in Southeast Asia. It breeds almost exclusively in containers in and around houses, is predominantly anthropophilic and feeds mainly indoors or in the immediate neighbourhood of houses during the

daylight hours. The original home of this species is Africa having established itself in this region since the turn of the century. Initially it was confined to the coastal urban areas but it gradually spread to inland cities and towns occurring side by side with and even replacing the native *Aedes albopictus* to varying extent. The suggestion has been made that the dengue haemorrhagic fever syndrome is the result of the appearance of a more virulent strain associated with the successful and progressive replacement of *Ae. albopictus* by *Ae. aegypti* in the urban areas of Southeast Asia. It has been shown that the incidence of dengue haemorrhagic fever is directly related to the *Ae. aegypti* - *Ae. albopictus* population balance in cities.

It is considered that *Ae. albopictus* which occurs in urban, rural as well as sylvatic areas is responsible for the transmission of jungle dengue viruses to monkeys and possibly also of a mild form of classical dengue to man. Thousands of macaques have been collected from the jungles since the War and exported through the Southeast Asian ports for poliovirus production. The hypothesis has been postulated that dengue haemorrhagic fever is a zoonosis *Ae. aegypti* having fed on these monkeys were now transmitting the jungle strain of viruses to man.

The present scare in Malaysia has resulted in widescale indoor spraying, fogging and aerial ultra low volume spraying of insecticides in an attempt to bring down the population density of the vector. This may be justifiable as an emergency measure but the most important and permanent control measure is the prevention of the breeding of *Ae. aegypti* in domestic water containers. For this, a carefully planned, professionally administered control programme, integrating all means of control is necessary. Public Health education should be given by men who know the biology of *Ae. aegypti*. For instance, it is not generally recognized that the adult *Aedes aegypti* lays its eggs just above the level of the water in vases and domestic containers. Merely emptying the containers will not destroy the eggs and refilling will give the opportunity for the larvae to hatch out. It is necessary therefore to scrub the inside of the water containers thoroughly. The cooperation of the public must be obtained and general sanitation improved to prevent breeding in tin cans, tyres etc. A fundamental method of reducing the vector population is the provision of adequate piped water supplies into homes, reducing dependence on storage containers. The squatter areas of our towns constitute one of the biggest problems in this respect since the water supply and sanitation here are most unsatisfactory.