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Thottapalayam Virus : A Presumptive Arbovirus Isolated From A Shrew In India*

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Thottapalayam virus is a previously undescribed agent isolated from the spleen of a shrew captured during July 1964 near Vellore, North Arcot District, Tamil Nadu, India. The virus is sensitive to sodium desoxycholate. By complement-fixation test, it shows no relationship to recognized arboviruses.

Introduction

During the 4-year period 1962-1966, various small animals were captured near Vellore, Tamil Nadu, and tested for the presence of virus in connection with studies then in progress, on the ecology of Japanese encephalitis virus in the region (Carey et al 1968). Among the animals were 67 shrews, *Suncus murinus*. From the spleen of one shrew, a previously undescribed virus, presumed to be an arbovirus, was recovered.

Material and Methods

The techniques used in this laboratory for isolation of virus in infant mice and preliminary identification studies by complement-fixation (CF) test have been described (Myers et al 1965). For tests of haemagglutinating activity of the agent, antigens were

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prepared from infected mouse brains by sucrose-acetone extraction (Clarke and Casals 1958). The test for sensitivity to sodium desoxycholate was performed as prescribed by Work (1964).

Results

Spleen removed from a shrew caught in Thottapalayam, North Arcot District, and submitted to the laboratory on July 23, 1964, was stored at -50°C until January 1, 1965, when a 10% suspension was made in phosphate-buffered salt solution with added penicillin and streptomycin. Of seven 1-day-old mice inoculated intracerebrally (i.e.) with a portion of the spleen suspension (Vellore 10017), six sickened within 8-10 days and four of these developed paralysis. Two of the mice not taken for passage died by the 14th day. When infected brain suspensions were passed, all the inoculated 1 to 2 day-old mice became ill, and those not used for passage died by the 11th day. Reisolation was attempted 10 days after the original inoculation, with results practically identical to those of the first series.

Passage 3 virus passed through a bacteria-tight Seitz filter pad. Adult (21-day-old) mice inoculated i.c. with passage 6 virus showed no signs of illness, nor did 5 to 6 week-old mice inoculated with passage 10 virus. At passage 11, 1-day-old mice inoculated intraperitoneally all sickened within 6-7 days, and 100% mortality occurred by the 10th day. In 1-day-old mice inoculated i.c. with passage 11 virus, the incubation period was likewise 6-7 days; 100% mortality occurred within 9 days; and the titre of virus exceeded 10^7 LD₅₀/0.02 ml.

Passage 13 virus was found to be sensitive to treatment with sodium desoxycholate.

No haemagglutinating activity was detected when a sucrose-acetone extract of passage 14 virus-infected brains was tested, both before and after addition of protamine sulfate, with goose erythrocytes in a pH range from 6.0 to 6.8 at room temperature (about 22°C).

In CF tests done at Vellore, antigen for the new isolate (prepared as saline extract of infected brains) reacted in its homologous system but not with hyperimmune mouse sera for Sindbis, Chikungunya, dengue, Umbre, Chittoor, Sathuperi and other ungrouped or unidentified viruses isolated in Vellore.

Infected mouse brains of the new isolate were sent on wet ice to the Virus Research Centre, Poona, and a lyophilized preparation made there (I An 66412) was forwarded to the Yale Arbovirus Research Unit (YARU), New Haven, Connecticut, USA, for further study. In CF tests at YARU, antigen for agent I An 66412 did not react with grouping hyperimmune mouse ascitic fluids for arbovirus groups A, B, C, Guama, Bunyamwera, Simbu, California, Anopheles A, Anopheles B, Turlock, Capim, Tacaribe, Vesicular stomatitis, Quarantil, Kaisodi and Qalyub. Results also were negative when a hyperimmune mouse ascitic fluid for agent I An 66412 was tested with antigens prepared for nearly 150 different grouped and ungrouped arboviruses.

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The new virus has been named Thottapalayam, after the locality where the shrew was collected. The agent's sensitivity to sodium desoxycholate suggests that it may be an arbovirus.

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