Evidence of circulating hantaviruses in Brazilian Amazonia through high prevalence of antibodies in residents of Manaus, Brazil

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In August 1991, blood samples were taken from neighbors and relatives of people who had died suspect of haemorrhagic fever in Manaus, Amazonas State. Eighty-four serum samples were obtained. All samples were tested against yellow fever, hepatitis B and Delta and leptospirosis. The results were negative. These sera were subsequently submitted by indirect immunofluorescent antibody (IFA) to Hantaan (the aetiological agent of the haemorrhagic fever with renal syndrome) for screening. The results of IFA showed a high prevalence of antibodies to Hantaan, with a positivity of 45.2%. All positive samples (N=38) were tested by ELISA for confirmation and 6 (19.3%) were positive, 4 of them to Hantaan and 2 to Puumala, another Hantavirus related with human disease. In view of the high positivity, 48 samples from blood donors of Manaus and 48 from Tucuruí, Pará State, were also submitted to IFA with 26 (54.3%) and 5 (10.4%) samples positive, respectively. As a result of the data obtained we concluded that the infection by Hantaviruses is extremely common in Manaus and recommend attempts to isolate the agent from blood of febrile patients and from tissues and blood of rodents, as well as new studies to characterize the clinical spectrum of human infection and its importance in public health.

In agosto de 1991, um inquérito sorológico foi realizado entre familiares e vizinhos de indivíduos falecidos em Manaus, Estado do Amazonas, com suspeita de febre hemorrágica. Foram obtidos 84 soros que foram testados para febre amarela, hepatites B e Delta e leptospirose. Os resultados foram negativos. Os mesmos soros foram, então, submetidos ao teste de imunofluorescência indireta (IFI) para Hantaan (agente causal da febre hemorrágica com síndrome renal) como teste de triagem. Trinta e oito amostras mostraram-se reativas, representando uma positividade de 45.2%. Todos os soros positivos foram submetidos ao teste de ELISA para Hantaan e Puumala, vírus do gênero Hantavirus associados com doença humana e 6 (19.3%) confiram-se positivos, sendo 4 para o Hantaan e 2 para o Puumala. Em decorrência da elevada taxa de positividade, 48 amostras de doadores de sangue de Manaus e 48 soros procedentes de Tucuruí, Estado do Pará, foram submetidos aos testes de IFI como controles. Os testes mostraram 26 (54.3%) e 5 (10.4%) soros positivos, respectivamente. Face aos dados obtidos concluímos que a infecção por Hantavirus é muito comum em Manaus. Finalmente, recomendamos que tentativas de isolamento viral a partir do sangue de pessoas febris e de tecidos e sangue de roedores sejam feitas para obter-se o vírus circulante em Manaus, bem como estudos para caracterizar o espectro clínico da infecção humana e sua importância em termos de saúde pública.

The discovery of Hantaan virus in 1976 launched a new era in the study of haemorrhagic fever with renal syndrome (HFRS) throughout the world. Accumulated data indicate that there are about 200,000 HFRS patients in the world each year with a 3.7% case fatality (1).

We know now that Hantaviruses are ubiquitous throughout the world and field mice and urban rats are reservoir hosts of HFRS. Although HFRS is still not recognized in certain parts of the world, it is possible that many of these areas have either not intensively searched for hantaviruses or currently lack diagnostic capability (1). Therefore, the members of the genus Hantavirus — Bunyaviridae, have a worldwide distribution and are apparently the exception in that family, just because they are not arboviruses. A Hantaan-related virus was isolated in 1984 from the lung tissue of a Rattus norvegicus captured in Belém, Brazil (2). Following this isolation, serosurveys were carried out in several different regions of the country. A high prevalence of antibodies has been found in São Paulo State. In the Amazonian region no evidence has been found to suggest circulating Hantaviruses as being causative agents of human disease, since neither a high prevalence of antibodies nor actual human disease have been re-
ported. Although in one study of 500 people living in several localities in the Amazon region, 7% were shown to have antibodies to the Hantaan virus (3). On the other hand, antibodies to Hantaviruses in rodents have been found frequently in several areas of Brazil (3,4).

In August 1991, several deaths were reported as being due to a haemorrhagic fever in Manaus, Amazonas State. Yellow fever antibody examination was negative. Neither hepatitis B and Delta nor leptospirosis antibodies were found in high titer by the usual tests or by IgM detection. The cases occurred between January and July 1991. In August 1991, an epidemiological study was carried out in Manaus, in an attempt to clarify the aetiological agent of these deaths. Eighty-four samples were taken from people living in or near the homes of 7 of the individuals. An average of 45.2% (N=38) of positivity (titer ≥ 1:32) for Hantaan (HTN) was found by the indirect immunofluorescent antibody test (IFA). Thirty-one of the samples were tested by ELISA (IgG) against prototype HTN and Puumula (PUU) antigens and 6 (19.3%) were positive. Of these, 2 were positive for PUU and 4 for HTN (Table 1).

The titer of samples ranged from 1:100-1:400. Forty-eight sera of blood bank donors in Manaus were also tested by IFA and 26 (54.3%) were positive. Out of 48 other sera from Tucuruí, Pará State, examined by IFA, only 5 (10.4%) were positive (Table 2).

From the data obtained, we can conclude: 1) There is a high transmission rate of Hantaviruses in Manaus; 2) This virus is probably different from all other known Hantavirus; 3) Attempts to isolate this virus from both rodent tissues and human blood (taken from individuals suspected of infection) are needed; 4) A serosurvey is necessary to identify the zones of high risk of infection, as well as to characterize the clinical spectrum of human disease; 5) Manaus is a free port. It is possible that the virus arrived there on a cargo vessel carrying infected rodents or sick crew members; 6) Tucuruí, which has no harbor, had a low prevalence of antibodies to Hantaviruses.

References and notes

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