A NEGATIVE HUMAN SEROSURVEY OF
HAEMORRHAGIC FEVER VIRUSES IN DJIBOUTI

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Viral haemorrhagic fevers (VHF) comprise a group of at least 13 diseases
caused by viral infections which may produce severe haemorrhagic complications. VHF are distributed throughout much of the tropics and subtropics.
The aetiological agents belong to various families of viruses and can be
classified epidemiologically into 4 groups according to their modes of transmis-
sion [5]. VHF are geographically limited, and of the 13 human diseases known
to occur worldwide, only a few can be found in any defined area. In Djibouti,
situated in the north of the Horn of Africa, 9 VHF viruses could have
epidemiological or public health relevance, since they have been described
to occur in some of the surrounding countries. These 9 viruses include yellow
fever (YF), dengue (DEN), Chikungunya (CHIK) and Rift Valley fever (RVF)
of the mosquito-borne VHF; Congo-Crimean (CON) of the tick-borne VHF;
Hantaan (HTN) and Lassa fever (LAS) of the zoonotic VHF; Ebola (EBO)
and Marburg (MBG) of the VHF of unknown transmission mode.

The regional epidemiology of the nine VHF of interest in northeast Africa
has been compiled by Karabatsos in 1985 [4]. YF is a flavivirus endemic to
The dengue viruses comprise 4 strains of flaviviruses. DEN-2 has been in-
criminated most consistently in East Africa. It has been isolated in Kenya


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and, more recently, from febrile patients in Port Sudan [3]. DEN-1 is also suspected to be present in Sudan [3], while DEN-3 has been isolated in Mozambique [2]. CHIK, an alphavirus isolated from Tanzania and Central and South Africa, is suspected to occur in Ethiopia (i.e. positive serologies are available, but the virus has not yet been isolated) and recent evidence suggests that it may be present in southern Sudan [8]. RVF is a phlebovirus endemic in several sub-Saharan countries including Kenya and also occurs in Egypt and in Sudan. CON is a nairovirus known to be present in Ethiopia, Kenya and a number of Central and West African countries. HTN, a hantavirus, is suspected to infect man in many areas of the world including Egypt (NAMRU-3, unpublished data), based on data from positive serosurveys. LAS, an arenavirus, occurs in epidemic waves in Nigeria and other West African countries but has not been isolated from East Africa. Two strains of EBO have been isolated, one from Zaire and one from Sudan. EBO-Zaire is suspected to occur in Kenya [7]. Finally, MBG was first found in South Africa. It is also present in Kenya [6], and serological studies indicate that it may be present in Sudan [8].

Since VHF have the potential to develop into dramatic epidemics, health authorities in tropical countries should identify all VHF foci and have detailed information on their epidemiological dynamics. Data have not been available concerning the prevalence of VHF in Djibouti, despite the high infection problem in other northeast African countries. Therefore, a human sero-epidemiological survey was conducted in Autumn 1987.

A total of 160 subjects were studied. Of these, 50 were healthy soldiers from all parts of the country and presently enrolled in the National Djiboutian Army; 69 were healthy inhabitants of Randa, a small village in northern Djibouti characterized by a rather stable population; and 41 were sick patients hospitalized in Djibouti City for an undiagnosed febrile illness. At the time of the study, no subject had haemorrhagical signs accompanying an infectious disease process.

Each individual was subjected to an epidemiological interview, conducted by a local physician, and had up to 10 ml of venous blood drawn. Sera were separated, stored frozen and transferred to Cairo where the various serological tests were performed.

Serological assays for YF, DEN-2, CHIK, RVF, CON, HTN, LAS, EBO-Sudan, EBO-Zaire and MBG were performed using immunofluorescence tests. Antigen microdot slides were prepared from a virus-infected Vero cell line [1]. Sera were initially screened at dilutions of 1/10. All 160 sera tested
negative for antibodies to all 9 viruses investigated, with the exception of one serum which exhibited positive reactivity to CHIK. This serum was further titrated and produced IgG reactivity at a titre of 80 for CHIK. IgM was also investigated and results indicated a titre of 20. This serum also reacted positive for Sindbis (SIN), another alphavirus with which CHIK is known to cross-react.

The subject seropositive for CHIK was in fact not a native of Djibouti. He was a 40-year-old man from the Ethiopian Afar triangle who had come to Djibouti 2 months earlier seeking treatment for abdominal pains related to massive splenomegaly. He did not recall any previous severe disease, febrile skin rashes or enlarged lymph nodes. He had lost much weight, felt fatigued but was afebrile. He had slight leucopenia (4,300 leucocytes/μl, with 2,000 polymorphs, 1,550 lymphocytes and 700 monocytes), which was compatible with hypersplenism. No blood parasites were detected on thin film; HIV serological was negative. We believe that his positive CHIK serology was indicative of an old CHIK infection, probably contracted while in Ethiopia where CHIK infection has been described [4]. Alternatively, SIN infection could be possible though unlikely as SIN has not been described in Ethiopia.

In conclusion, none of the 9 VHF investigated seem to have led to recent human infection in the Republic of Djibouti. Despite the high infection rates by these viruses in the human populations of some of the neighbouring northeast African countries, and despite the high mobility of people in the Horn of Africa, these infectious agents seem to be of little threat to the inhabitants of Djibouti.

The one seropositive Ethiopian subject probably had antibodies from an old infection contracted while in Ethiopia and therefore did not represent an autochthonous Djiboutian case of CHIK infection. This particular case report is nevertheless important since it indicates a way in which VHF viruses could be introduced into Djibouti. Since Aedes mosquitoes are present in Djibouti, the potential for transmission of arboviruses is very real and the epidemiology of these viruses should be monitored attentively.

Key-words: Viral haemorrhagic fever; Djibouti, Serosurvey.

Résumé

Sérosurveillance humaine négative des virus des fièvres hémorragiques à Djibouti

Afin d'étudier la présence à Djibouti de virus causant les fièvres hémorragiques humaines, nous avons testé un total de 160 sérum provenant d'habitants de cette région de la Corne de l'Afrique. Les 9 virus étudiés sont ceux de la fièvre jaune, de la dengue, de la fièvre de la vallée du Rift, ainsi que les virus Chikungunya, Congo-Crimée, Hantaan, Lassa, Ebola et Marburg.
Aucun sérum provenant d'habitants de la République de Djibouti n'a réagi pour l'ensemble des 9 tests d'immunofluorescence indirecte effectués. Pour un patient éthiopien hospitalisé à Djibouti Ville, le résultat sérologique a évoqué une ancienne infection à virus Chikungunya, probablement contractée en Éthiopie, où cette virose est présente. Nos résultats suggèrent qu'en République de Djibouti, aucune des viroses étudiées n'a récemment infecté la population humaine.

MOTS-CLÉS: Fièvre hémorragique virale; Djibouti, Sérosurveillance.

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