EPIDEMIOLOGICAL COMMENTS

Crimean-Congo haemorrhagic fever

SUMMARY:

A brief description is given of the first locally discovered case of Crimean-Congo Haemorrhagic Fever. The clinical sequence of events leading to the death of a 13 year old boy receives mention. Prior to his illness he had spent a week at a Veld School in the Bloemhof district.

The disease outbreak response mechanism, which was established some years ago, is described in terms of the action taken.

Some notes of a more general nature on Crimean-Congo Haemorrhagic Fever conclude the account.

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Introduction

Every year school children in the Transvaal are afforded the opportunity of spending about a week of their normal school time, or part of their holidays, out in the veld. Use is made of camps known as Veld Schools and there are enough to accommodate 60 000 pupils per annum. Outdoor nature study, hikes, films, games and the indispensible charm of the camp fire all contribute towards rekindling an inherent love of nature which tends to be suffocated by the many attractions of modern city life. The many letters of appreciation from teachers, pupils and parents testify to the excellence of the scheme.

One such school is situated in the Bloemhof district of the Western Transvaal on the farm Panfontein, part of which has been set aside for the S.A. Lombaard Game Reserve. It can accommodate about 300 pupils at a time. The camp is clean and hygienic, the children sleep on beds in tents and there is an abundance of wild life in the reserve, such as Black Wildebeest, Red Hartebeest, Springbok and Impalas.

A Tragic Incident

Steven G., a 13 year old pupil of Edenvale near Johannesburg, was one of a group of children who attended the Veld School for the week 5 to 13 February 1981. He was well until 13 February. On 14 February he developed headache and complained of dizziness, consulted his private practitioner who discovered a tick firmly affixed to his scalp. This tick was later identified as being of the genus HYALOMMA, although the one attached to Steven's scalp was thrown away after it had been removed and killed.

A provisional diagnosis of tick bite fever was made and treatment instituted.

On 15 Feb there was no improvement and when Steven deteriorated further on 16 Feb he was put on full doses of Erythromycin and Chloramphenicol despite which he developed a swinging temperature. On 17 Feb he developed clinical and biochemical evidence of disseminated intravascular coagulopathy with haematemesis, meleana and oozing from venepunture sites. He was then admitted to the Johannesburg General Hospital. The most significant findings emerging from the full haematological index of 67% on admission falling to a lowest value of 21%, a haemoglobin value of 12,9 g% on admission falling to a lowest value of 4,4 g% (on 18 Feb) which rose to 9,7 g% with the administration of fresh blood. The platelet count varied between 69 000 and 13 000. There was no hepatosplenomegaly, nor was any rash seen initially. Petechiae did however develop on 18 Feb.

Despite aggressive treatment Steven continued on a downhill course, suffered repeated haematemeses and demised on 19 February 1981.

The definitive diagnosis of Crimean-Congo Haemorrhagic Fever was made by the National Institute for Virology on 26 February.

The Disease Outbreak Response Mechanism

In respect of the viral haemorrhagic diseases of Africa there exists a central co-ordinating Committee which was assembled as soon as the diagnosis became known. The actions taken by the Committee are summarised below.

i. Surveillance

All known contacts were placed under personal surveillance, namely hospital contacts, family contacts and all children who were members of the group to which Steven belonged. It was found that eight children of the group developed symptoms suggestive of meningo-encephalitis between 16 and 20 February. All made uneventful recoveries and in no instance was Congo virus isolated.

Two nursing sisters, who had been in close contact with the patient developed flu-like illnesses and were placed in isolation. Both recovered quickly and completely and neither yielded Congo virus.

ii. Information

Liaison was established with the press, media and all authorities linked with the incident. The World Health Organisation and international reference laboratories were informed.

iii. Technical Preparedness

Steps were taken to ensure the availability of staff and isolators should the need arise.

iv. Local prevalence of infection

To establish the extent of the local infection an entomologist collected some 3 000 hyalomma ticks in and around the camp. Two National Epidemiological Service Officers

To page 25

From page 23

visited the area, questioned the three local medical practitioners regarding possible further infections there (which might have gone unnoticed) and took blood specimens from all staff members and their families at the veldskool, 74 in all. These were delivered to the National Institute for Virology and the results of the analyses are being awaited.

v. Closure of Bloemhof Veld School until all investigations have been completed.

Brief notes on Crimean-Congo Haemorrhagic Fever

CCHF was first described as it occurred in the Crimea in 1944 by Russian investigators. The causative agent was found to be serologically indistinguishable from Congo virus, first isolated in 1956.

It is an ARBO-virus classified under Bunyaviridae. For a synoptic review of one of the many virus classifications, see Figure 1.

The diverse geograhpical distribution of the virus is notable; it is found in parts of Asia, Europe and Africa. The virus has been isolated from a large number of tick species, the one implicated locally being Hyalomma marginatum rufipes, better known as the "bontpoot tick" on account of its typical light and dark leg markings. These are "two-host" ticks, larvae and nymphs feeding on birds and small mammals, and adult ticks mainly on cattle and sheep. Infected ticks tend to occur in fixed, defined foci. Adults feed from October to March with a peak in February. It is believed that both transovarian and trans-stadial transmission of the virus occurs. This feature is the basis for continued transmission from one season to the next. As far as is known natural infection causes disease in man only, although viraemia does occur in infected animals too.

Transmission to man occurs through a tick-bite or via contamination with infected blood products of a tick, animal or man.

Three possibilities may be encountered after infection with Congo virus. The incubation period is 2 - 7 days and 5 out of every 6 infected persons have no symptoms at all. Secondly, a flu-like illness may develop, often bi-phasic.

CCHF in Africa

Prior to this case a total of 12 cases of Congo fever were described on the continent of Africa, one of which was fatal. It is presumed that the infection was brought into South Africa by a migratory bird carrying an infected tick from an endemic area further north.

No additional cases are expected to arise in association with this index case which, on the face of it, appears to have been a freak event, a chance of "one-in-a-million". Until the results of the field investigations are known CARE will be the watchword and the camp will remain closed.

Figure 1

VIRUS CLASSIFICATION

(Adapted from MEDICAL VIROLOGY by Fennar and White, 1976)

Animal Viruses

DNA-VIRUSES	**Examples**
Parvoviridae	
Papovaviridae	Human wart virus
Adenoviridae	
Herpetoviridae	Herpes simplex Herpes zoster Varicella
Poxviridae	Smallpox, Alastrim, Molluscum contagiosum
RNA-VIRUSES	
Picornaviridae	Enterovirus: Poliomyelitis, Echo, Coxsackie
	Rhinovirus: Common cold
Togaviridae	Alphavirus: Haemorrhagic fever, Yellow fever Encephalitis
	Flavivirus
Bunyaviridae	Crimean-Congo Haemorrhagic Fever
Arenaviridae	Lassa Fever
Coronaviridae	Common cold
Retroviridae	Oncovirinae
Orthomyxoviridae	Influenzavirus
Paramyxoviridae	Mumps, Measles
Rhabdoviridae	Rabies
Reoviridae	Infantile diarrhoea
"Unclassified"	Virus hepatitis

Typical features are fever, severe headache with retro-orbital pain, myalgia and arthralgia, backache, photophobia and occasionally conjunctivitis.

Finally the above picture is complicated by all the features characteristic of coagulopathy: petechial rash, epistaxis, haematemesis, melaena and uterine bleeding. Hepatosplenomegaly may be found and this syndrome has a case-fatality rate of 5-30%. Death occurs on the 7th to 9th day of the disease and is due to oligaemic shock. In patients who recover the temperature falls after the 9th day and convalescence is slow lasting up to four weeks.