Viral hemorrhagic fever: epidemiology and control

Takeshi Kurata

Department of Pathology,
National Institute of Infectious Diseases,
Tokyo 162, Japan

The viral hemorrhagic fever (VHF) is characterized by the following three points: 1) the illness associated with a number of geographically restricted viruses, 2) clinically fever, and in the most severe cases, shock and hemorrhage are prominent, 3) the agents of Lassa, Marburg, Ebola and Crimean-Congo hemorrhagic fevers (CCHF) are known to have caused significant person-to-person transmission. Therefore these diseases caused by four agents are defined as so-called VHF.

Infection with Lassa virus occurs through contact with *Mastomys natalensis* or its excreta in the household. Person-to-person spread requires close personal contact or contact with blood or excreta. Illness begins insidiously with fever, sore throat, weakness and malaise. Except for direct contact with infected tissues, blood, secretions and excretions, poorly equipped situation of hospitals virtually eliminates the risk of infections.

CCHF had been recognized in Asia came to international attention after outbreaks in the Crimean peninsula in 1944 and 1945. Many wild and domestic animals act as rerervoirs for the virus, including cattle, sheep, goats and hares. Ixodid ticks, genus *Hyalomma*, act both as reservoir and vector for CCHF. Contact with blood, secretions, or excretions of infected animals or humans may also transmit infection.

Ebola hemorrhagic fever was first recognized in 1976 in southern Sudan and second in northern Zaire. After these epidemic, 6 outbreaks occurred in Africa. Case fatality rate in epidemic was 53–88%. Secondary person-to-person transmission results from close personal contact, including the nursing of the patients.

As for Marburg hemorrahgic fever, in 1967, 25 people in Germany and Yugoslavia handling African green monkeys from Uganda became ill with 7 death and 6 secondary cases. In Africa, four small outbreaks have been confirmed in 1975–1987.

To control VHF, general principles such as i) surveillance, ii) applied research, iii) prevention and control, iv) infrastructure are required. Furthermore, Maximum Biosafety Laboratory (MBSL) is required for manipulation of these viruses. The suit-type MBSL is now operated at Special Pathogens Branch, CDC, USAMRIID, Fort Detrick, NIH, USA, Pasteur-Meriew Institute (Lyon), and Canadian Institute of Health (Winnipeg). The Cabinet-line system laboratory in Japan at NIID has not yet been used for level 4 viruses because of political objections.

References

1) Monath, T. P.1975. *Bull. WHO*, 52: 577–592.
2) Hoogstraal, H. 1979. *J. Med. Entomol.*, 15: 307–417.
3) WHO. 1976. *Bull WHO*, 56: 247–270.