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Technical Advisory Group on Human Monkeypox

Report of a WHO Meeting

Geneva, Switzerland
11-12 January 1999

WORLD HEALTH ORGANIZATION
Department of Communicable Disease Surveillance and Response

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I. Introduction

The WHO Technical Advisory Group Meeting on Human Monkeypox was convened by the Department of Communicable Diseases Surveillance and Response (CSR). Dr. Martinez (Director, CSR) opened the meeting by noting that large outbreaks of human monkeypox had been reported from the Democratic Republic of the Congo (DRC) since early 1996. The epidemiological and laboratory features of the outbreaks remain incompletely defined, and the Advisory Group was convened to review the available data, and advise the organization on the appropriate measures to be taken. In particular, the Advisory Group was charged with:

1) identification of areas for further research into the public health impact of human monkeypox, and development of appropriate disease control mechanisms
2) formulation of recommendations to be considered by the Ad Hoc Committee on Orthopoxvirus Infections, meeting 14-15 January 1999.

Dr. Joel Breman was elected chairman and Dr. Joseph Esposito was elected Rapporteur. The Technical Advisory Group participants are listed in Annex 1. For one session of the meeting, the Advisory Group divided into 2 sub-groups to discuss specific issues and formulate recommendations relating to: (1) epidemiology and control, and (2) laboratory and ecologic research.

II. Background

Although monkeypox was first identified in primates in 1959, it was not recognized as a cause of human disease until 1970.* Reports of human monkeypox from 1970 to 1986 revealed 404 cases, mainly in children under age 16, in 7 west and central African countries (DRC, Côte d'Ivoire, Sierra Leone, Cameroon, Central African Republic, Liberia, Nigeria). Of these, 338 cases were identified during WHO intensified surveillance from 1981-86 in DRC (1980 population ~ 28 million), mainly in Equateur and Bandundu Provinces, and to a lesser extent in Kasai Oriental Province. Virtually all reported cases were investigated actively by WHO teams working in DRC. Of the 338 cases, 67% were seen during the rash stage and later verified as monkeypox by virus isolation. Twenty-three percent were seen soon after disease onset and were verified clinically and by detection of orthopoxvirus (OPV) antibodies in serum. The remaining 10% were corroborated by careful examination of epidemiological and clinical data. Vaccination scars indicated that 13% of the 338 patients had been immunized against smallpox, most of these >10 years previously. Primary or co-primary infections resulting from animal-to-human contact accounted for 72% of the cases, with inter-human transmission responsible for 28%. Clustering of cases in households was rare, as were chains of inter-human transmission beyond 2 generations; only 11, 3 and 1 cases proceeded to the third, fourth, and fifth generations, respectively. The overall case-fatality ratio was 10%.

* Jezek Z and Fenner F. *Human monkeypox.* Monographs in Virology, vol. 17. Basle, Karger, 1988.

Local population immunity from smallpox vaccination (which protects against monkeypox with >85% efficacy) was relatively good, with estimated coverage of ≥60% during the 1970s and early 1980s. The secondary attack rate (SAR) was 9% for unvaccinated residents of the same household, 7% for all unvaccinated contacts, and 1% for all vaccinated contacts. These are markedly lower than smallpox SARs of 20% to 70%. Limited ecological and anthropologic studies detected monkeypox virus in one diseased squirrel (*Funisciurus anerythrus*) captured in DRC. However, OPV antibodies were identified in several squirrel and monkey species, as well as in other wild-caught animals in the endemic areas, indicating that monkeypox virus may have a broad host-range.

In 1986, intensified surveillance was discontinued. From 1987 to 1992, 12 cases were reported and verified by laboratory tests: 1 from Cameroon, 5 from DRC, and 8 from Gabon, the latter being a previously unknown endemic country. These numbers suggest that without intensified surveillance, incidence may be dramatically under reported.

III. Recent studies in the DRC, 1996-1998

Field and laboratory investigations

Between February and August 1996, 71 cases of human monkeypox, including 6 deaths, were reported amongst a population of 15,698 in 13 villages in the Katako-Kombe health zone, Kasai Oriental, Zaire by local investigators. Three WHO sponsored multi-agency short-term missions were undertaken in 1997-98 to investigate this outbreak and continuing reports of cases through July, 1998. Their aims were to determine the magnitude of the outbreak, the risk factors for infection, assess the sustainability of transmission, and implement the most appropriate disease control measures. Active door-to-door case search was conducted in villages where cases were reported. A case was defined as an individual having a history of vesicular, pustular, or crusty rash, not clinically diagnosed as chickenpox, since February 1996.

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