STUDIES OF PERSISTENT AND LATENT EQUID HERPESVIRUS 1 AND HERPESVIRUS 3 INFECTIONS IN THE PIRBRIGHT PONY HERD

R. Burrows, D. Goodridge
Animal Virus Research Institute, Pirbright, Surrey GU24 ONF, U.K.

ABSTRACT

The Pirbright pony herd is a closed herd and has no contact with other horses. Nasopharyngeal swabs and blood samples are collected at frequent intervals. Equine herpesvirus 1 was isolated from several animals following stress situations, and serological evidence of periodic EHV-1 and EHV-3 activity was obtained from many animals. Attempts to demonstrate virus reactivation following corticosteroid treatment or the presence of latent virus in trigeminal ganglia were unsuccessful.

INTRODUCTION

Three herpesviruses are known to infect horses: equid herpesvirus 1 (EHV-1) which is associated with rhinopneumonitis and abortion (Doll and Bryans, 1963) and, occasionally, paresis (Saxegard, 1966); equid herpesvirus 2 (EHV-2) which may or may not be associated with disease; and equid herpesvirus 3 (EHV-3), the cause of coital exanthema (Girard et al., 1968), a venereal disease characterised by herpetic lesions on the external genitalia. Persistent infections with EHV-2 in which virus can be recovered intermittently from the nasopharynx and the white cell fraction of the blood are well documented but persistent latent infections with EHV-1 and EHV-3 have been less easy to demonstrate, although Erasmus (1966) isolated EHV-1 on at least five occasions from groups of horses three to ten days after injecting them with live attenuated African horse sickness viruses.

This report presents some evidence for the reactivation of latent EHV-1 and EHV-3 infections in ponies maintained in isolation from other horses at the Animal Virus Research Institute, Pirbright.

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MATERIALS AND METHODS

The Pirbright herd of pure and crossbred Welsh mountain ponies was established between 1967 and 1971 to provide animals with a known history for studies of the abortifacient properties of EHV-1 strains and respiratory tract viruses of horses. Apart from the introduction of new stallions in 1974 and 1977, the herd has been self-contained since October 1971. The ponies have no contact with other horses and, unless mixed for experimental or breeding purposes, are kept in separate groups according to age and sex. Most of the ponies are kept outdoors during the summer and housed during the winter. Eight separate grazing areas, ten covered courts and one isolation unit with bathing and changing facilities are available. The numbers of ponies in the herd between 1972 and 1982 ranged from 49 to 85, with a yearly average of 61. Five to 19 foals were produced each year (average 11) and one to 21 ponies (average 11) were discarded. Past and present ponies in the herd total 197.

Ponies used for experimental purposes were housed in an isolation unit and were not returned to their original group for at least six weeks. Some details of natural and experimental infections in the herd have been recorded (Burrows and Goodridge, 1973, 1975, 1978, 1979). Before and between experiments, all ponies were inspected daily and, if signs of respiratory or other disease were seen, appropriate samples were taken and screened for virus in equine foetal kidney cell cultures. Blood samples were taken at frequent intervals and the sera stored at -20°C. Neutralising antibody titres were determined by plaque reduction rests (Burrows, 1966), using equine foetal kidney or rabbit kidney cell line (RK-13) cell cultures and complement fixing antibody titres by an overnight microtest (Thomson et al., 1976).

RESULTS AND DISCUSSION

Equid herpesvirus 1

(a) Virus recovery

Virus may be isolated from the naso-pharynx of most horses for periods of eight to 10 days after infection or