A Comparison of Neurovirulence of Vaccinia Virus by Intrathalamic and/or Intracisternal Inoculations into Cynomolgus Monkeys

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The authors have studied the virulence of several vaccinia virus strains by intrathalamic (i.t.) inoculation into cynomolgus monkeys for the purpose of analysing the pathogenesis of postvaccinial encephalopathy or encephalitis (1, 3). Before these studies, we performed a quantitative comparison of the neurovirulence in monkeys by i.t. and/or intracisternal (i.c.) inoculations with Lister strain as well as CV 1 strain of vaccinia virus.

The reference Lister (calf lymph) vaccine and the CV 1 vaccine which was kindly provided from Dr. C.H. Kemp, University of Colorado, were grown in the chorioallantoic membrane (CAM) of 11 to 12 day eggs. The virus was purified from CAM homogenates by fluorocarbon treatment and sucrose gradient centrifugation, and adjusted to $4 \times 10^8$ PFU/ml. Monkeys were inoculated intrathalamically and/or intracisternally with 0.5 ml each of serial 10-fold dilutions of the virus. Nine monkeys were used for each experiment and three monkeys for each dilution.

The mortality of the monkeys inoculated with each virus strain and by the different inoculation routes, is summarized in Table 1. With the Lister strain the mortality of the monkeys inoculated intrathalamically was slightly higher than that by the i.c. route. Furthermore, there was no clear difference in the mortality between the i.t. inoculation and combination of both i.t. and i.c. routes. This led the authors to use i.t. inoculation only in further experiments as described elsewhere (1, 3, 5). The CV 1 strain appeared more virulent than the Lister strain in monkeys inoculated by either route.

The macroscopic and histological findings of the monkeys inoculated with both strains were not different from those described elsewhere (1, 3, 5). The characteristic lesions were widespread inflammation in the meninges and choroid plexus, and parenchymal lesions which were referred to as encephalopathy, as described previously (3). There was no difference in the histological findings and localization of lesions between animals inoculated by different routes. This may be accounted

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for by the readiness of the inoculated virus by either route to reach the meninges and choroid plexus, where virus can multiply luxuriantly, as shown in another report (3). It has recently been established that vaccinia-specific antigens could be demonstrated in the meninges of human postvaccinial meningoencephalitis (2, 4). Therefore, comparison of various vaccinia strains by i.t inoculation into monkeys was considered to be of utility in selecting candidate attenuated vaccinia strains for smallpox vaccine preparation.

**REFERENCES**


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