SEPARATION OF TWO STREET RABIES VIRUS STRAIN POPULATIONS INTO TWO BIOLOGICAL VARIANTS

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We described (*1*) strains of street virus which, after intracerebral (i. c.) inoculation in random bred 6—7 g white mice, caused acute and chronic clinical forms of rabies. A heterogeneity of the populations of the strains as to biological properties could thus be assumed.

By "cloning" based on duration of disease and incubation period, we obtained on i. c. inoculation of random bred 6—7 g white mice two biological variants of the Yak strain of street rabies virus, namely acute rabies (AR) and chronic rabies (CR) variants. The AR variant was isolated and passaged using brains from mice in the stage of full paralysis after short incubation and clinical periods, while for the isolation and passaging of the CR variant we used brains from mice with slight clinical manifestations after comparatively long incubation and clinical periods.

The AR variant caused in animals an acute form of rabies with a disease period of up to 6 days. The disease was characterized by ruffled hair, rapid development of paralysis involving all extremities and prostration. Irrespective of the dose of inoculum death followed not later than 10—15 days after inoculation. In all mice inoculated with AR diluted 10^{-1}, the incubation period lasted 4 days in passages 1-3 and 3 days in passages 4-27. The virus titre reached 7.5 log LD_{50}/0.03 ml.

The CR variant caused acute and chronic rabies. In the latter, the incubation and clinical periods lasted significantly longer. The disease lasted from 8-10 to 55 days and was characterized by a slow onset, a phase of strong irritation and intense clinical convulsions of the head and body followed by a stage of slow development of Landry type paralyses, prostration and death. The virus titre in the brains up to the 7th day of disease did not surpass 5.5 log LD_{50}/0.03 ml, decreasing till the 30th-55th day to 1 log LD_{50}/0.03 ml. The ability to cause chronic rabies in 20—43% of diseased animals was regularly preserved for 14 passages (the observation period). Using the method described above, we obtained AR variants from the CR variant at the 1st, 2nd, 3rd and 8th passage levels.

A similar separation into AR and CR variants was successful also in the street virus strain BE (isolated from a badger) at the 3rd passage level.

We failed to produce chronic rabies by AR variants of the strains Yak (passages 1, 2, 3 and 8) and BE as well as by the CVS strain of fixed virus, in a great number of animals inoculated with various doses of virus.

The rabic nature of the variants derived from strains Yak and BE was confirmed by direct immunofluorescence, demonstration of Babes-Negri bodies and neutralization tests in mice with commercial anti-rabies IgG.

The results obtained indicate that the populations of strains Yak and BE were heterogeneous as to biological properties; this phenomenon has not yet been reported. The isolation of the AR variant and persistence of its properties for 27 passages indicate that it was selected from an AR+ + CR population of the original strain which maintained its properties for 14 passages under the same experimental conditions.

Reference

1. Gribencha, S. V., Korolev, M. B., and Stefanov, S. B. *Vop. Virus.* **22**: 147, 1977.