FURTHER OBSERVATIONS ON THE PATHOGENESIS OF RABIES IN GUINEA-PIGS AFTER EXPERIMENTAL INFECTION WITH THE FLURY STRAIN

by

C. HUYGELEN

(Received September 2, 1959).

In previous papers (Huygeelen and Morteelmans 1958, 1959) experiments were reported on the pathogenesis of rabies in guinea-pigs following experimental inoculation with the Flury strain of rabies virus into the muscles of the hind leg. The virus content of the different portions of the central nervous system was titrated during the incubation period, during the period of clinical symptoms and after death. The results demonstrated that the virus first multiplied in the lumbosacral cord and subsequently spread in the direction of the brain. A close parallelism was observed between these virus titers and the course of the clinical symptoms, characterized by ascending paralysis.

In the experiments here reported an investigation has been made into the dissemination of rabies virus after intramuscular inoculation into the foreleg and after injection by the intravenous route.

MATERIALS AND METHODS.

All experiments were carried out on guinea-pigs, weighing between 300 and 400 g, and one month old albino mice, obtained from the breeding colony of the laboratory.

The Flury strain of rabies virus, originally obtained from Dr. Koprowski, was at its 48th egg passage level and it titrated $10^{-5.85}$ in mice. For both intramuscular and intravenous inoculations we used 1 ml of a 40 % chick embryo suspension, but the material used
On the pathogenesis of rabies in guinea-pigs.

for the intravenous injections had to be clarified previously by centrifugation at 1500 revolutions per minute, because the large particles tended to obstruct the small gauge needles. The intravenous injection was given into the dorsal veins of the penis.

Suspensions of the different portions of the central nervous system of the guinea-pigs were made in normal saline after centrifugation at 1500 revolutions per minute for ten minutes. Four to six mice were used for each dilution and all mice were observed for 21 days.

Experiments.

In a first experiment 25 guinea-pigs received one ml of a 40 % chick embryo suspension intramuscularly into the right foreleg. At regular intervals after inoculation one or two guinea-pigs were killed and samples taken from their brain hemispheres, bulb, cervico-thoracic cord and lumbosacral cord. Suspensions of each of these samples were injected intracranially into mice.

On the whole 14 guinea-pigs were killed and examined for the presence of virus in the different segments of the central nervous system; 11 animals remained for control: 10 died between postinoculation days 9 and 12 and one survived.

The first symptoms in the guinea-pigs left as control animals were observed on the 7th day and were characterized by paralysis of the right foreleg, followed by paralysis of the left foreleg and subsequently by involvement of the bulbar centers and death. Generally the course of the disease was much shorter than in guinea-pigs inoculated into the hind legs.

All guinea-pigs killed during the first six postinoculation days were apparently perfectly normal. One animal (A) killed on the 7th day showed paralysis of the right foreleg and the other (B) paralysis of both forelegs and symptoms of bulbar paralysis. The guinea-pig sacrificed on the 8th day was nearly completely paralyzed.

The results, summarized in table 1, show that no virus could be recovered from the guinea-pigs killed during the first three days. In one of the guinea-pigs killed on the 4th day and in one of those killed on the 5th day virus could be detected in the cervico-thoracic cord. In the animal sacrificed on the 6th day, the virus was present in the cervico-thoracic cord and also, but in smaller quantities in the bulb and in the lumbosacral cord; no virus could be isolated from