In a previous communication, Yaoi and Arakawa (1) have described on inoculation experiment of measles virus upon mice by intracerebral injection.

Recently, the author has succeeded in the fixation of the same virus, by using the blood of a patient(2).

The virus causes the same symptoms in mice, and became “fixed” after 4 passages through mice: One of the 10 first generation mice was killed under doubtful symptoms and obtained the 2nd generation in which, 3 of 10 mice became ill within 3 to 14 days and died in 10 to 30 days.

In the 3rd generation, 5 of 5 animals fell ill on the 3rd to 11th days. In all the succeeding generations all mice inoculated contracted the disease and died on about 5th day, thus, the fixed virus was obtained.

Infected mice are very irritable, on being touched they would cry “Chi-Chi” and lift their fore legs.

They assume an attitude as if to stand erect elevating half the body. Some times they bite experimenter’s finger. Soon after, the mouse stretches forth the legs and tremble, and after 2 or 3 hours at the most, bends its body backwards like a bow and dies in rigidity.
Conjunctivitis, depilation, and diarrhea are found rather often. In very rare instances, papules or vesicles were produced on some part of the tail. Swelling was seen also at the middle part of tail.

In one case, swelling produced about the joint of the left fore leg and tail changed to haemorrhagic necrosis on the following day. From time to time, the depilation with fine yellowish bran-like desquamation is seen.

In another case, yellowish crust appeared symmetrically on the front aspect of the knee, followed by exfoliation and the spot remained unhaired and shiny. Furthermore, necrotic patches on the tip of tongue, poppy seed in size, and purpuric coloration of the tip of tongue were rather frequently seen.

At autopsy, pulmonary haemorrhage was seen in almost all cases.

Gray-coloration of the liver in varying grades was also very frequent.

Pathologic changes in spleen were not distinct. Swelling and haemorrhage of the kidney was seen in some cases.

Although some encephalo-meningeal symptoms such as chronic convulsion associated with opisthotonus and stretching of legs and vigorous trembling of body, etc., were characteristically observed in the beginning, following the passage, through many generations encephalomyelitic symptoms, such as paralysis of the legs and death in comatose state, became very marked. Dancing-movement was seen from time to time. The heightened irritability, seen in the early stage of the disease, however, remained unaltered.

Any inoculation method, intracerebral, intraocular, subcutaneous, intraperitoneal, intravenous, or intranasal, caused the mice to be fatally infected.

In addition to the mouse, the guinea pig and albino rat can also be inoculated with fatal outcome by intracerebral injection.

In the inoculated monkey, leucopenia and some rise in temperature is observed by the 5th or 7th day.

The virus passes readily through the gradocol membrane of 290 μ and 175 μ. Moreover, it passes through the Seitz-EK filter without marked drop in virulence.

The virus then is evidently filterable and its size is considered by the author to be nearly the same in size or probably smaller than the virus of Japanese epidemic encephalitis (end-point 60 μ) as estimated by Yaoi and others (3).

The virus is uninfluenced by glycerine and phenol. It is affected by X-rays and is inactivated when the dose is increased.

Active and passive immunization can be established by this virus. The mice, immunized with the virus material obtained from infected mouse brain, regardless of whether the virus is living or attenuated by the X-ray, are capable of withstanding the infection. It is especially noteworthy that the virus, attenuated by the X-ray, exhibits very potent antigenic properties.

The virus is neutralized by the adult human serum.

The mice on a diet, deficient in vitamin A and C, are more susceptible to the virus.
REFERENCES


INVESTIGATIONS IMMUNOLOGIQUES DU VIRUS DE LA FIÈVRE DE RIFT VALLEY

par YASUTI NAGANO
Institut des Maladies Infectieuses, Tokyo

Le pouvoir vaccinant du virus inactivé

Il est généralement admis que le virus de la fièvre de Rift Valley peut être inactivé par le formol tout en gardant sa fonction immunogène.1) Le pouvoir vaccinant d'une émulsion du virus formolé, est-il conditionné par un petit nombre du virus vivant qui a échappé de l'action du formol? Chez la Souris, espèce très sensible à ce virus, injectée avec le virus formolé, on n'arrive à déceler le virus actif ni dans le foie, ni dans le sang circulant, même en essayant des inoculations successives. Notons d'ailleurs que les souris ayant résisté à l'inoculation de virus à des doses très voisines à la dose mortelle ne se montrent jamais réfractaires à l'inoculation d'expérience.

Il est connu que le virus de la fièvre de Rift Valley fait produire les anticorps chez le Lapin et le Cobaye, espèces chez lesquels le virus ne se multiplie pas.2) Ces faits observés ne légitiment pas la notion classique: "sans infection, pas d'immunité". Le pouvoir vaccinant du virus de Rift Valley ne dépend pas de son pouvoir multipliant.

Les propriétés immunogènes du virus tué, diffèrent-ils de ceux du virus vivant? En comparant les doses de virus nécessaires pour faire apparaître les anticorps chez le cobaye, nous avons constaté que la dose minimale immunisante du virus vivant est de 20 à 200 fois la dose mortelle pour la souris alors que celle du virus formolé est de 2,000 à 20,000 fois la dose mortelle. Nous avons vu ainsi que le pouvoir antigène du virus est affaibli considérablement par action du formol.

En ce qui concerne le moment où les anticorps apparaissent dans le sang chez l'animal vacciné, nous avons constaté que le virus tué, en dehors de toute attente, immunise plus vite que le virus vivant. Voici un exemple des expériences. Un matériel virulent (le sérum des souris infectées) est divisé en deux parties. Une moitié est ajoutée avec le formol à 0,9 pour cent et laissée à la température de laboratoire pendant trois heures, l'autre moitié ne reçoit aucun traitement. 0 ce 3 de chacun est injecté aux cobayes par