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**A CHANGE OF THE PROPERTIES
OF THE Q-FEVER CAUSATIVE AGENT**

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Journal of Microbiology, Epidemiology and Immunobiology (Russian Journal No. 1, 1963, pp. 152). Translated by Sp/6 Charles T. Ostertag, Jr.

A Change of the Properties of the Q-fever Causative Agent, Communication I. Biological Properties of Variants D and B-D-1 of the Grit Strain of Rickettsia burnetii (Author's Summary). Kravchenko, A.T.; Yakovlev, A.I.; Gudima, O.S.; and Polozov, A.I. (Submitted to Editorial Office 16 July 1961).

Results are presented of the experimental study of a mildly virulent variant of the Grit strain of Rickettsia burnetii. The strain was obtained in 1954 from the Gamaleya Institute of Epidemiology and Microbiology of the USSR Academy of Medical Sciences after 44 passages in chick embryos. They supported the strain further by passages in the vitelline membrane of chick embryos. They didn't study the virulence of a culture of the 44th - 52nd passage in chick embryos, and when pigs were infected with large doses of a culture of the 53rd passage in chick embryos, a febrile reaction was absent in the animals, but 21 days after the administration, specific complement-fixing antibodies were detected in the blood. This variant of Grit strain was designated as Grit-D.

In comparative tests it was established that in guinea pigs infected with the original Grit strain, febrile forms of the infection were sometimes encountered during infection with small doses of rickettsias. Infiltrates appeared at the site of administration of the causative agent, as a rule simultaneously with an increase in temperature. During contamination with a sufficiently concentrated culture (dilution 10^{-1} - 10^{-4}), in several cases there were observed necrotization and ulceration at the site of administration of the rickettsias. Variant D regularly caused a febrile reaction in animals just with the administration of the concentrated material (dilution of the culture 10^{-2} - 10^{-3}). Along with this, in many of the animals the fever confined itself to an increase of temperature up to $39.6 - 39.8^{\circ}$ in the course of 2-3 days. In spite of the sharp lowering of the causative agent's ability to cause a febrile illness in guinea pigs, the ability to form infiltrates was preserved (in individual animals a local reaction was observed with the administration of a culture up to a dilution of 10^{-7} - 10^{-8}). However, their intensity and duration was considerably less than in animals infected with the original Grit strain. The titers of complement-fixing antibodies in guinea pigs infected with variant D and the Grit strain are in direct relation to the dose of rickettsias administered, but with one and the same doses they were considerably lower in animals infected with variant D. The analogous rules were also established in comparative experiments for determining the virulence of variant D and the Grit strain during the intraperitoneal, intramuscular, and intracutaneous methods of infecting guinea pigs.

With the aim of determining the stability of the reduction of pathogenic properties, variant D was passed 5 times through the testicle

of guinea pigs and one time each through two species of Ixodoidea ticks - Lipicephalus sanguineus and Haemaphysalis concinna.

In guinea pigs, infected both with the original variant D and with variants obtained after passage, the duration, incubation period, height and duration of fever, the presence and degree of intensity of infiltrates at the site of administration of the rickettsias, and also their reverse development turned out to be identical.

Finally Rickettsia burnetii (variant D) were subjected to the action of ionizing irradiation. An aqueous solution of radioactive phosphorus ($\text{Na}_2\text{HP}^{32}\text{O}_4$) served as the source of radiation. A study of the variant, obtained after a 4-multiple irradiation with doses of 500, 1200, 1800 and 2520 mc for 1 liter, and 22 subsequent passages in chick embryos (BD-1), showed that its virulence became lower than in the original variant D. However, after two additional passages in chick embryos without irradiation, its virulence was restored.

Observations showed that variant D, based on its biological properties, doesn't differ from variant M which is spontaneously separated from the Grit strain described earlier by Zdrodovskiy and Genig. The similar biological properties of the specified variants and the community of the source where they were obtained (Museum of Rickettsial Strains of the Gamaleya Institute of Epidemiology and Microbiology of the USSR Academy of Medical Sciences) allow us to maintain that variant D is identical to variant M.