

DIFFERENCES IN THE ACTION OF INTRAVENTRICULAR INJECTION OF BACTERIAL PYROGEN AND α -DINITROPHENOL ON TEMPERATURE REGULATION

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In this investigation the changes in temperature regulation arising after intraventricular injection of bacterial pyrogenal and of α -dinitrophenol (DNP) were compared.

Chronic experiments were carried out on 88 rabbits. The method of injecting the solutions into the lateral ventricle was described previously [1-3].

The intraventricular injection of 1.0, 0.5, 0.1, and even 0.001 μ g pyrogenal led in all rabbits to the development of an acute pyrexial attack (an increase in rectal temperature from 38.0 to 40.4°, with a latent period of about 1 h, and lasting for up to 17-24 h before returning to normal).

The injection of physiological saline had no effect on the body temperature. The intravenous injection of a larger dose of pyrogenal (5 μ g/kg) was accompanied by a much shorter pyrexial reaction (5-6 h), but its latent period was slightly shorter (30-45 min).

Despite the acute pyrexial reaction, the injection of pyrogenal into the ventricle did not cause significant changes in the oxygen consumption of the animals, whether in the phase of rise of body temperature or at its period of maximal increase, demonstrating that changes in physical temperature regulation are more important during the development of "centrogenic" fever.

The mechanisms of development of fever were thus similar to those concerned when pyrogens are injected by the usual methods, and they evidently consist essentially of the limitation of heat emission.

In contrast to this, the intraventricular injection of 100, 1000, and 2000 μ g DNP caused no significant changes in the body temperature (or in the oxygen consumption).

The intramuscular injection of a standard dose of DNP (25 mg/kg) led to a marked increase in oxygen consumption and to an increase in body temperature from 38.8 to 39.9°.

The results obtained demonstrate that the two agents differ in principle in their mode of action on the heat exchange. Bacterial pyrogens, in minimal doses, cause an active neurogenic increase in body temperature — a pyrexial reaction — whereas DNP, which is mainly, (if not entirely) a peripherally acting agent, even in relatively large doses, has practically no direct effect on the temperature-regulating structures of the brain.

LITERATURE CITED

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