Neuropatologic lesions of the brucella toxin

by

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The neuropatic symptoms in brucellosis are predominant. Sometimes these symptoms are dependent of brucella localization in nervous system, as we can see in Roger & Pursines and Valenti's monographies and others. Nuncio observed nervous lesions with cultures of lived or killed brucella by venous or epidural inoculation.

The nervous symptoms may be done by brucella toxin. To verify this possibility, toxic products of brucella were obtained from cultures of brucella in albimi broth during 14 days in incubator, filtering in Seitz EK, preserved with toluol and frigo.

Lots of mice, 20-22 gr, were injected by venous or peritoneal way and the brain of animals dead or killed after 10 days of the injections, were fixed in formol, alcool or Cajal liquid. The stains used were: cresyl-violet at Spielmeyer, Gomori and Rio-Ortega.

Mices injected on the same days with albimi broth served as control.

Regressive changes such as vacuolation of the cytoplasm, necrobiosis and necrosis of nerve-cells in the nerve centers, alternating with apparently normal cells were observed in mice injected intravenously (Fig. 1).

Microglia of the affected areas undergoes changes corresponding to the early stages of mobilization. Acute swelling of oligodendrocytes was noted, without ameboid swelling of astrocytes. Vessels and meninges were normal.

Primary or toxic reactions of nerve-cells and slight microglial proliferation occurred in mice injected in the peritoneum. Oligodendrocytes and astrocytes remaining normal.

No changes in central nervous system were found in the controls.

The experiments were done also with extracts of bacilli bodies after treatment by ether, acetone, or ether-cloroform mixture, evaporating the solvent after bacterial contact and used in the same ways.

Bacterial suspension of killed brucella in saline were used as control. The brain of animals dead or killed after 2-3 days were plunged into the same liquids referred to above for histological studies.

Mice injected intravenously with this antigen showed lymphocytic infiltration of the leptomeninges, hyperemia, perivascular infiltration
by mononuclears, acute swelling of Purkinge cells and oligodendrocytes as well as edema. Microglia and astrocytes were normal (Fig. 2).

Similar changes besides clasmatoendrosis of astrocytes were seen in the brain of mice injected in the peritoneum. Meninges appeared normal (Fig. 3).

Hyperemia, acute swelling of oligodendrocytes and moderate hypertrophy of astrocytes were noted in the brain of mice injected with suspension of killed brucella, as control.

Conclusion: Changes of the nervous tissues were induced in mice after injection with substances produced by brucella in albimi broth or extracted from bacilli bodies. These changes suggest explanation to nervous symptoms observed in the human brucellosis.