A RAPID METHOD OF INDUCING AMYLOIDOSIS IN MICE

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A new modification of the casein model of amyloidosis in mice is suggested, whereby the time for development of amyloidosis is reduced to 5-10 days.

KEY WORDS: *mice; casein amyloidosis.*

Experimental amyloidosis in mice induced by injections of casein (casein amyloidosis) is an analog of secondary amyloidosis in man. Convenience of the object (small animals) and the simplicity and stability of reproduction of amyloidosis all account for the wide use of the casein model for the study of pathogenetic mechanisms of amyloidosis and methods of its prevention and treatment in research conducted both in the USSR [1] and elsewhere [2].

However, in the usual form of the casein model the first deposits of amyloid appear as a rule only after many injections (on the 12th-18th day according to a single report [3], but on average on the 25th-30th day of the experiment). In the modified model now suggested the period of development of amyloidosis is shortened to 5-10 days.

EXPERIMENTAL METHODS

Male CBA, BALB, and C57BL and female C57BL mice (150 animals altogether), weighing not less than 18-20 g, were used. The animals were given daily subcutaneous injections of 1 ml of sodium caseinate, made up as follows: a 13% aqueous solution of casein was boiled for 50-60 min, NaOH was added to a final concentration of 0.25%, and the solution was boiled again for a further 1 h. Before injection the filtered casein was warmed to 37-40°C.

EXPERIMENTAL RESULTS

The first amyloid deposits in CBA and C57BL mice (both males and females), detected histologically with thioflavin T and Congo red, appeared in the spleen on the 3rd day of the experiment after 2 or 3 injections of sodium caseinate in approximately 80% of the animals. After 5 injections massive deposits were formed in the spleen of all the animals (Fig. 1) and amyloid appeared in the liver also. By the 10th day of the experiment (8-10 injections) amyloid was found in the kidneys, adrenals, and heart of all the animals as well as in the spleen and liver. Amyloid appeared in the BALB mice on the 5th day, but the subsequent development of amyloidosis followed the same course as in the CBA and C57BL mice. It should be noted that secondary amyloidosis (not experimental) develops fairly frequently in CBA mice, especially in old animals, and for that reason random tests of the animals must be carried out in the course of the experiments.

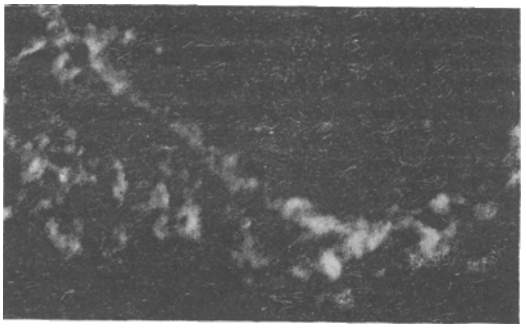

Fig. 1. Mouse spleen (5 injections of casein). Amyloid at periphery of follicle. Stained with thioflavin T, 60×.

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The results demonstrate definite advantages of the modified model, for its use can shorten the duration of the experiment and reduce the number of animals required (in the case of prolonged stimulation death of a large proportion of the animals before the end of the experiments is inevitable).

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