EFFECT OF Cx-REACTIVE PROTEIN ON IMMUNOLOGIC REACTIVITY OF RABBITS OF DIFFERENT AGES

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Young rabbits aged 8 and 24 days were injected simultaneously with Cx-reactive protein and antigen (horse γ-globulin). After the 2nd injection of antigen, a reaction of secondary type was observed in a larger number of animals than in the group of rabbits not receiving Cx-reactive protein at the first injection of antigen.

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Considerable changes take place in immunologic reactivity in the course of ontogenesis. In newborn animals its level is very low by comparison with adults. Nevertheless, according to some observations the immunologic inertia in the early stages of ontogenesis can be overcome by the use of adjuvants [1,2].

We have previously shown that injection of Cx-reactive protein (Cx-RP) into adult rabbits stimulated antibody formation [3,7].

The object of the present investigation was to determine whether the immunologic inertia of young rabbits can be overcome by injecting them with Cx-RP, as has been described for other adjuvants.

EXPERIMENTAL METHOD

The method of isolation and titration of Cx-RP was described previously. The titer of Cx-RP was expressed in millimeters of precipitate formed by precipitation with anti-serum in capillary tubes [4].

Experiments were carried out on chinchilla rabbits aged 8 and 24 days. The age of the animals was chosen on the basis of results indicating that primary immunization of rabbits aged 10 days is ineffective, only a partial effect is obtained with rabbits aged 18 days, and a complete effect is found only in rabbits aged two months or more [6].

Horse γ-globulins (HGG) were used as antigen and were injected as a single dose of 50 mg per rabbit intravenously. Fx-RB was injected intravenously along with the antigen in a dose of 0.5 mg per animal.

The content of Fx-RB in the rabbit sera was determined before injection of antigen, daily for 5 days, and also on the 7th, 10th, 15th, and 20th days after injection. The sera were titrated by the ring-precipitation method. The titer of the serum was taken to be the highest dilution of antigen with which the serum reacted. Blood for titration was taken on the 5th, 7th, 10th, 15th, and 20th days after injection of HGG.

EXPERIMENTAL RESULTS

In the first experiment, rabbits (17 animals) aged 8 days were immunized with HGG and 11 of them were injected simultaneously with Cx-RP.

During the first 24 h after injection of antigen, Cx-RP appeared in the blood of the young rabbits and its concentration reached a maximum after 24-48 hr, falling sharply until the 3rd day after injection. In the animals receiving Cx-RP along with HGG (group 1), the concentration of Cx-RP in the blood increased more intensively than in the rabbits receiving antigen only (group 2). The maximal titer of Cx-RP in the

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TABLE 1. Effect of Injection of Cx-RP Along with the Primary Injection of HGG on Antibody Formation in Response to a Second Injection of Antigen (mean data)

Group	Number of rabbits	Day after second injection of HGG				
		5	7	10	15	20
		Titer of sera				
1st (primary injection of HGG and Fx-RP, secondary injection of HGG only)	11	1:17 000 (6)	1:25 000 (9)	1:10 000 (8)	1:8500 (8)	1:7400 (7)
2nd (injected twice with HGG only)	6	1:20 000 (1)	1:30 000 (2)	1:10 000 (1)	1:10 000 (1)	1:750 (2)
3rd (adult rabbits; single injection of HGG)	17	— (0)	1:5000 (2)	1:12 000 (8)	1:6000 (9)	1:350 (7)

Note: Number of rabbits with antibodies in blood serum given in parentheses.

animals of group 1 was 3 ± 1.5 mm, and in the animals of group 2 it was 1.5 ± 1 mm. Accordingly, although no antibody formation could be observed in any of the rabbits of either group, we assumed that immunological changes could nevertheless take place in the lymphatic system of the animals of group 1. To verify this assumption, we used the method previously suggested by T. K. Khalyapina [6]. All 17 rabbits received a second injection of 50 mg HGG per animal 1.5 months after primary immunization. Fx-RP was not injected a second time. The data showing the dynamics in serum titers of the reimmunized rabbits are given in Table 1, and for comparison the titers of adult rabbits after a single injection of 50 mg HGG are given (group 3).

It is clear from Table 1 that the serum titers of young rabbits which formed antibodies in response to the second injection of HGG were practically the same in the animals of both groups. However, injection of Fx-RP simultaneously with the first injection of HGG led to a statistically significant increase in the number of rabbits in which antibodies were formed in response to the second injection of antigen ($P < 0.05$). Evidently in this case a secondary response was in fact observed. Evidence of this is given by the shortening of the latent period and the earlier occurrence of maximal titers than during the primary response obtained to a single injection of HGG into adult rabbits (group 3).

In the second experiment young rabbits 24 days old (12 animals) were immunized once with HGG, 7 of them receiving Cx-RP at the same time as the antigen. Just as in the previous experiment, maximal titers of Cx-RP in the blood of the young rabbits receiving Cx-RP along with the antigen were higher than in the animals receiving HGG only (3.5 ± 2 and 1 ± 0.5 mm respectively). The appearance of antibodies in both groups was observed on the 20th day after injection of antigen. It must be emphasised that in all 7 animals receiving Cx-RP this led to antibody formation (serum titers from 1:2000 to 1:20,000), whereas after injection of antigen alone, positive serum titers were found in only two of the five animals (1:1000 and 1:2000).

The results of our experiments show that Cx-RP stimulates immunogenesis at all stages of ontogenesis, including in the early postnatal period. Even in rabbits aged 8 days, despite the evident absence of an immunologic response, as a result of the combined injection of antigen and Cx-RP changes took place in the lymphatic system.

The immunologic inertia of the early postnatal period can thus be overcome by injection of Cx-RP which, as previously shown [5], ensures the necessary intensity of protein synthesis in immunologically competent organs.

LITERATURE CITED

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