

## EXPERIMENTAL INDUCTION OF ATHEROSCLEROSIS IN RABBITS

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In the study of the pathogenesis of atherosclerosis and in its treatment the experimental production of this disease in laboratory animals is very important. For this purpose the method most widely used until the present time has been that suggested by N. N. Anichkov [1]. The production of experimental atherosclerosis in rabbits by N. N. Anichkov's original method takes 3 months or longer [2-6].

Having in mind research on the subject of coronary atherosclerosis, we have attempted to induce well-marked experimental atherosclerosis in rabbits in a shorter time than was previously possible, by varying the dosage of cholesterol.

### EXPERIMENTAL METHOD

Usually the cholesterol is administered to the rabbits through a tube, with a large volume of vegetable oil, which has the additional effect of altering the usual dietary regime; introduction of the tube may also cause some degree of trauma to the animals, especially in the hands of persons who have not mastered the technique. We therefore gave cholesterol in the form of a mixture with grated carrot. The animals ate this mixture readily, and always ate it completely.

The rabbits received daily 3 g of cholesterol in 100 g of grated carrot, which made up one third of the daily ration of 300 g of food. Our data on the daily dose of cholesterol of 1% of the weight of the ration agreed with those of Bragdon [8].

For the experiment we selected 12 male rabbits of the chinchilla breed, weighing from 1.9 to 3.0 kg. We divided them into two groups: the rabbits of the first group received cholesterol in the proportion described daily for 30-35 days; the rabbits of the second group - for 60-70 days (see Table).

### EXPERIMENTAL RESULTS

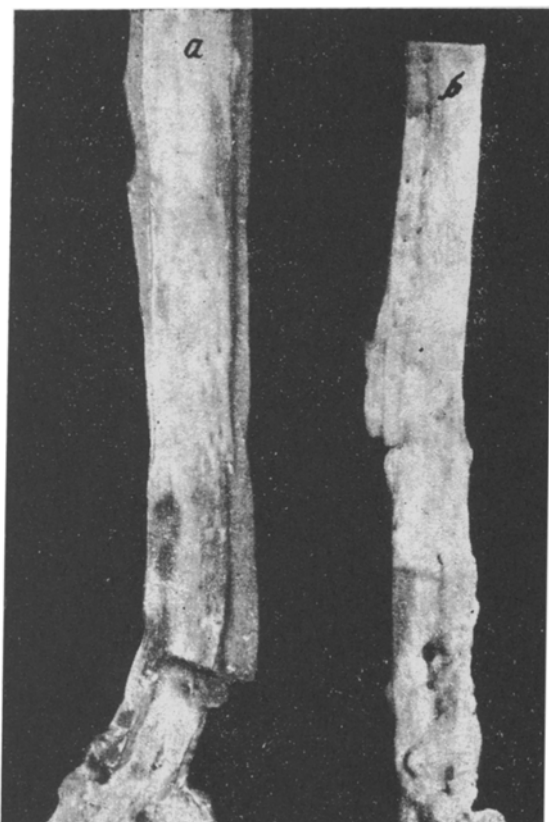
The animals of the 1st group showed no abnormal tendencies in their behavior: they ate all their food, and in the course of the experiment they gained in weight significantly more than did the control animals. The rabbits of the 2nd group showed some degree of sluggishness, which appeared on about the 40th day from the beginning of feeding, but they ate their food completely and did not lose weight in the course of the experiment (see Table).

Pathological anatomical examination of the 4 animals of the 1st group that were killed revealed thickly disseminated individual large plaques, yellowish white in color, on the entire internal surface of the aorta, which in places had the appearance of large confluent areas. In 2 rabbits of this group a small number of yellow and white plaques were found on the internal surface of the aorta throughout its extent. In all 6 rabbits of the 1st group the liver was slightly enlarged; its edge was rounded off with the surface, and on section it had the color of clay.

# Results of the Experiments to Produce Atherosclerosis in Rabbits

Rabbit No.	Weight of rabbit (in g)		Number of days of feeding	Macroscopic changes in the aorta
	at the start of the experiment	at the end of the experiment		
43	3000	3200	31	++
477	2000	2200	35	+++
34	1950	2050	34	++
52	2000	2200	34	+++
39	2100	2350	32	+
54	2050	2500	35	+++
89	2900	2850	67	+++
453	2600	2900	65	+++
224	2700	2850	70	+++
430	2700	2900	60	+++
455	2800	2650	70	+++
495	1900	2250	60	++

Conventional designation of the atherosclerotic changes in the aorta: +++ severe changes, ++ moderate, + slight.



General appearance of the aorta of a rabbit with experimentally induced atherosclerosis.

a) Lipoid stains and atherosclerotic plaques in the aorta of rabbit No. 34 after 34 days of feeding with cholesterol; b) the same in the aorta of rabbit No. 430 after 60 days of feeding with cholesterol.

At postmortem examination of the rabbits of the 2nd group, in all 6 animals on the internal surface of the thoracic and abdominal portions of the aorta and also on the branches emerging from it were observed thickly disseminated, small linear and larger elongated plaques, yellowish or white in color, some of which were firm in consistency.

In 5 of the 6 rabbits we also observed whitish or yellowish plaques on the aortic semilunar valves and on the mitral valves of the heart. In all 6 rabbits the liver was somewhat enlarged and its edge was rounded; superficially and on section it was clay colored.

Characteristic pathologicoanatomical changes of experimental atherosclerosis in the rabbit were thus obtained in all the animals; they were particularly expressed in the animals of the 2nd group.

The experimental results described demonstrate that the method adopted is perfectly suitable for the production of experimental atherosclerosis in rabbits in shorter periods of time.

This communication is a part of a paper which we have written describing a study of the mechanisms of coronary insufficiency in a chronic experiment.

## SUMMARY

By changing the usual dose of cholesterol it was possible to shorten the period of experimental induction of atherosclerosis from 3-6 months to 2 months. The daily dose of cholesterol equalled 1% of the total weight of food fed to the rabbits. This was continued

for 2 months. Taking into consideration that large amounts of vegetable oil change the usual diet of the animals, cholesterol was mixed with grated carrots (3 gm of cholesterol to 100 gm of grated carrots).

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