

# CHOLESTEROL CONTENT IN ORGANS AND TISSUES OF CONTROL AND CHOLESTEROL-FED MONKEYS

L. A. Uzunyan

UDC 616-008.939.22-092.9-02 : 613.288 : 547.922

Feeding monkeys on a diet with excessive cholesterol for 3 years leads to an increase in the cholesterol content in the aorta and, in particular, in its abdominal portion; the cholesterol content in the liver and adrenals is not increased. After 6 years the cholesterol content in the liver and adrenals is doubled, and its content is lowest in the thoracic portion and arch of the aorta, and not in the abdominal aorta.

Previous publications have contained details of the blood cholesterol content in Macaca rhesus and Papio hamadryas and also of the dynamics of the blood cholesterol in monkeys receiving a diet with excessive cholesterol [4].

This paper contains information on the cholesterol content in organs and tissues of normal and cholesterol-fed monkeys.

## EXPERIMENTAL METHOD AND RESULTS

The experimental monkeys received 3 g (M. rhesus) or 5 g (P. hamadryas) cholesterol daily with butter and porridge. Products containing vegetable fats were excluded from the diet.

The aorta was carefully freed from the adventitia. Areas of the aorta free from plaques were investigated. Cholesterol was determined by the method of Sperry and Webb [7].

In normal animals the highest cholesterol content is found in the adrenals, it is much lower in the liver, and lower still in the aorta; in P. hamadryas the cholesterol content is the same in all parts of the aorta (Table 1), whereas in M. rhesus the cholesterol content in the arch of the aorta is a little higher than in the thoracic and abdominal portions. The cholesterol content in all tissues investigated from M. rhesus was slightly higher than in those from P. hamadryas (Table 1).

Feeding the monkeys on cholesterol for 3 years led to a marked increase in its content in the aorta, especially in the abdominal aorta. The cholesterol content in the liver and adrenals was unchanged.

In the monkeys of both species receiving cholesterol with the diet for 6 years there was a marked increase in cholesterol content in the liver and adrenals. The highest cholesterol content was found, not in the abdominal aorta, but in its thoracic portion and arch (Table 1).

Deposition of cholesterol in various organs during the period of hypercholesteremia has been described [5]. However, accumulation of cholesterol was observed in the organs investigated in the present experiment, despite the absence of hypercholesteremia. Possibly no excess of cholesterol was found in the blood because it was partially deposited in the organs and tissues, and partially broken down by the liver [3]. The development of atherosclerosis evidently does not necessarily go hand in hand with an increase

---

Institute of Experimental Pathology and Therapy, Academy of Medical Sciences of the USSR, Sukhumi.  
(Presented by Academician V. V. Parin.) Translated from *Byulleten' Éksperimental'noi Biologii i Meditsiny*,  
Vol. 72, No. 9, pp. 49-50, September, 1971. Original article submitted October 5, 1970.

© 1972 Consultants Bureau, a division of Plenum Publishing Corporation, 227 West 17th Street, New York, N. Y. 10011. All rights reserved. This article cannot be reproduced for any purpose whatsoever without permission of the publisher. A copy of this article is available from the publisher for \$15.00.

TABLE 1. Content of Cholesterol (in mg/g fresh tissue) in Organs of Control and Cholesterol-Fed Monkeys

Organ tested	Group of animals	M. rhesus			P. hamadryas		
		no. of expts.	$M \pm m$	$P$	no. of expts.	$M \pm m$	$P$
Liver	Control	30	$1,88 \pm 0,1$		20	$1,84 \pm 0,14$	
	Experiment	5	$1,9 \pm 0,25$	$> 0,5$	5	$1,9 \pm 0,23$	$> 0,25$
	3 years	10	$3,03 \pm 0,43$	$< 0,01$	7	$3,9 \pm 0,28$	$< 0,001$
Adrenal	Control	30	$22,6 \pm 2,9$		20	$15,6 \pm 3,1$	
	Experiment	5	$16,9 \pm 1,83$	$> 0,5$	5	$21,1 \pm 5,06$	$> 0,5$
	3 years	10	$41,6 \pm 8,04$	$< 0,001$	7	$40,7 \pm 7,4$	$< 0,001$
Arch of aorta	Control	30	$1,52 \pm 0,1$		20	$1,05 \pm 0,25$	
	Experiment	5	$4,16 \pm 0,95$	$< 0,001$	5	$1,9 \pm 0,45$	$< 0,05$
	3 years	10	$4,71 \pm 0,64$	$< 0,001$	7	$5,7 \pm 1,02$	$< 0,001$
Thoracic aorta	Control	30	$1,18 \pm 0,1$		20	$0,9 \pm 0,1$	
	Experiment	5	$2,9 \pm 0,72$	$< 0,001$	5	$2,9 \pm 0,55$	$< 0,001$
	3 years	7	$3,71 \pm 0,65$	$< 0,001$	7	$5,4 \pm 0,36$	$< 0,001$
Abdominal aorta	Control	30	$1,15 \pm 0,1$		20	$1,01 \pm 0,17$	
	Experiment	5	$7,4 \pm 0,9$	$< 0,001$	5	$8,4 \pm 2,02$	$< 0,001$
	3 years	7	$3,85 \pm 0,54$	$< 0,001$	7	$4,5 \pm 0,72$	$< 0,001$

in the cholesterol content in the circulating blood [6]. The frequency of an increase in the blood cholesterol concentration in atherosclerosis is slightly more than half of all cases [1, 2].

#### LITERATURE CITED

1. B. F. Ilinskii, Atherosclerosis [in Russian], Moscow (1960).
2. A. L. Myasnikov, Essential Hypertension and Atherosclerosis [in Russian], Moscow (1965).
3. L. A. Uzunyan and V. V. Lyul'eva, Byull. Éksperim. Biol. i Med., No. 2, 23 (1971).
4. G. M. Cherkovich and L. A. Uzunyan, Versuchstierk., 9, 236 (1967).
5. M. L. Armstrong, W. E. Connor, and E. D. Warner, Arch. Path., 87, 87 (1969).
6. J. E. Paterson, B. R. Cornish, and E. C. Armstrong, Circulation, 13, 224 (1956).
7. W. Sperry and M. Y. Webb, J. Biol. Chem., 187, 97 (1950).