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Effect of Varying Dosages of Potassium Iodide in Experimental Atherosclerosis. (22496)

A. W. MOYER, DAVID KRITCHEVSKY, W. C. TESAR, J. B. LOGAN, R. F. J. MCCANDLESS, R. A. BROWN, AND H. R. COX.

Viral and Rickettsial Section, Research Division, American Cyanamid Co., Lederle Laboratories, Pearl River, N. Y.

Several investigators have reported that potassium iodide(1,2), organic iodides(3) or desiccated thyroid(3) inhibited formation of atheromatous plaques in cholesterol-fed rabbits. While KI and organic iodides had a tendency to cause hypercholesterolemia, thyroid powder lowered serum cholesterol somewhat. Similar effects of these compounds on serum cholesterol have also been observed in chickens(4), although no anti-atherogenic influence was found. Recently, administration of KI to rats for very short periods was shown to cause a 2-fold increase in serum cholesterol (5).

The present study was designed to examine effects of various dosages of KI as well as of 2 thyroid-active substances (diiodotyrosine and thyroxine) on development of atheromata and on serum cholesterol and b-lipoproteins of rabbits fed cholesterol. The anti-atherogenic effects of large dosages of KI are confirmed.

Methods. Male rabbits of the Dutch belted strain were maintained on a diet of rabbit chow (Wayne Rabbit Ration, Allied Mills, Chicago, Ill.) which had been thoroughly mixed with a suspension of cholesterol in corn-oil so that every 100 g of food contained 2% cholesterol and 6% corn-oil. The basic diet was augmented with amounts of KI or of diiodotyrosine as noted in Tables I and II by spraying the appropriate solution on the pellets while they were tumbled in a concrete mixer. This was done before adding the cholesterol-oil suspension. The thyroxine was administered by the intraperitoneal injection of 0.05 mg, 3 times weekly. After 8 weeks the animals were sacrificed and aortas examined visually for atheromata and graded on a 0-4 scale. Averages for each group are given in Table I. In Exp. 1 and 2 the entire aorta was graded, in Exp. 3 the arch and thoracic portions were graded separately. Sera were assayed for cholesterol(6) and lipoproteins(7) and livers were excised, weighed wet and analyzed for cholesterol content. Average values of these are stated in Tables I and II.

TABLE I. Autopsy Findings on Rabbits Fed Cholesterol Diets Augmented by KI, Diiodotyrosine and Thyroxine.

Group*	No. of animals	Wt change (g)	Atheromata		Serum chol. (mg %)	Liver wt (g)	Liver chol. (%)
Exp. 1							
1% KI	9	—	.55‡		2170	70	2.9‡
B†	10	—	1.55		2260	98	8.3
Exp. 2							
1% KI	8	106	1.00§		3830	—	—
B	14	212	2.70		3150	—	—
Exp. 3			Arch	Thoracic			
.001% KI	10	132	2.20	1.40	2520	89	4.1
.01% "	9	60	2.11	1.44	2610	81	3.9
.1% "	8	−3	1.94	1.00	2490	75	3.6
1 % "	7	−59	.93§	.14	2400	63	2.3‡
DIT‖	10	117	2.65	1.40	2360	67	3.7
T¶	10	−51	1.75	.75	2270	88	4.0
B	7	81	2.43	.93	2800	80	4.0

* All diets contain 2% cholesterol, 6% oil. † B = Basic diet. ‡ $p < .0001$.
§ $p < .001$. ‖ 0.1% diiodotyrosine. ¶ Thyroxine, 0.15 mg/wk, i.p.

TABLE II. Serum Lipoprotein Levels of Rabbits Fed Cholesterol Augmented by KI, Diiodotyrosine and Thyroxine.

Group*	Serum lipoproteins, S_f mg %					
	0–12	12–20	20–35	35–100	100–400	Total
Exp. 1						
1% KI	480	727	528	650	461	2846
B†	165	550	851	650	411	2627
Exp. 2						
1% KI	998	649	616	1064	1209	4536
B	362	750	1223	1309	682	4326
Exp. 3						
.001% KI	261	555	1006	1388	696	4006
.01% "	158	490	864	1000	546	3058
.1% "	208	491	786	1106	816	3407
1 % "	367	464	522	956	1050	3359
DIT‡	186	448	773	1202	829	3438
T§	115	274	675	933	861	2858
B	241	481	845	1301	1073	3941

* All diets contain 2% cholesterol, 6% oil. † B = Basic diet. ‡ 0.1% diiodotyrosine.
§ Thyroxine, 0.15 mg/wk, i.p.

Results. The data show that only large amounts of KI had any significant effect on formation of atheromata. At levels administered, neither diiodotyrosine nor thyroxine inhibited atherogenesis. None of the compounds produced significant hypocholesterolemia, nor was there a distinct lowering in lipoprotein fractions. In this connection it is of interest that the concentration of the cholesterol-rich S_f 0-12 class lipoproteins(8) was higher in the group receiving 1% KI than in controls. Of groups in Exp. 3, that on thyroxine showed lowest cholesterol and lipoprotein levels although atheromata were considerably higher than those in animals being fed 1% KI.

Moses and Longabaugh(9) observed no significant reduction in atheromata when they administered small dosages of KI to growing rabbits. Groups receiving 325 mg KI daily (plus 15 g cholesterol/week) showed somewhat lower average atheromata than did the control group, while the atheromata of the group fed 20 mg KI were more severe. Rosenthal(10), using very small doses of KI (3-7 mg) in cholesterol-fed rabbits found elevated serum cholesterol levels, and more lipid in

aortas of these animals than in the controls. Greatest protection against atherosclerosis was observed when the cholesterol KI ratio was approximately 2:1. Turner(1,2) fed equal amounts of cholesterol and KI, and Page and Bernhard(3) fed approximately equal amounts of cholesterol and diiodoricinsterolic acid. Moses and Longabaugh(9) employed ratios of 7:1 and 100:1, with the former giving relatively greater protection.

In Exp. 3 there was a slight weight loss in groups receiving 0.1% KI, 1% KI and thyroxine, but the overall weight difference in all groups was small. Firstbrook(11) has pointed out the high correlation between relative weight gain and severity of lesions in experimental atherosclerosis in rabbits, but the gains and losses recorded in Exp. 3 are too small to have affected the results. Both KI and control groups gained in weight, and there seemed to be no correlation in individual animals between atheromata and weight change. The 1% KI diet, while causing no hypocholesterolemia, lowered average liver cholesterol content significantly.

Summary. 1. Groups of rabbits were fed a 2% cholesterol diet augmented with 0.001%, 0.01%, 0.1% and 1% potassium iodide, 0.1% diiodotyrosine, and one group received 0.15 mg of thyroxine weekly by intraperitoneal injection. 2. Serum cholesterol and lipoprotein levels of all animals were elevated, but atheromata were significantly reduced in those on diet containing 1% KI. The S_f 0-12 lipoprotein levels were also higher in animals of this group than in controls, but on the whole levels of liver cholesterol were lowest.

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Cytopathogenic Agent Resembling Human Salivary Gland Virus Recovered from Tissue Cultures of Human Adenoids. (22497)

WALLACE P. ROWE, JANET W. HARTLEY, SAMUEL WATERMAN, HORACE C. TURNER, AND ROBERT J. HUEBNER.

U. S. Department of Health, Public Health Service, N. I. H., National Institute of Allergy and Infectious Diseases, Bethesda, Md.

Smith(1) recovered a cytopathogenic virus from a human salivary gland demonstrating intranuclear inclusions characteristic of the human salivary gland virus. Subsequently, Weller(2) isolated a similar virus from a liver biopsy from an infant with a clinical diagnosis of cytomegalic inclusion disease. During the course of studies in this laboratory of the presence of adenoidal-pharyngeal-conjunctival (APC) viruses(3-5) in human adenoids, 3 strains of an intranuclear inclusion body-producing virus were isolated from adenoid tissue cultures in which the fibroblasts underwent spontaneous degeneration. This report describes some of the properties of the virus, the development of a complement fixation test, and the serological relationship of this virus to the strains isolated by Smith and Weller.

Materials and methods. Adenoids were obtained from children undergoing tonsillectomy-adenoidectomy at the Children's Hospital, Washington, D.C., and the Clini-