

*LETTER TO THE EDITOR*

**EFFECT OF BILATERAL VASECTOMY ON THE TISSUE LIPID PROFILES IN ALBINO RATS**

Sir,

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Vasectomy has been widely accepted as a popular contraceptive device. There are several contradictory reports on the vasectomy (7, 11, 13, 15). While some investigators reported that vasectomy leads to depression or loss of libido, degeneration of testis, hyperplasia of interstitial elements, reduction in testicular weight, impaired spermatogenesis, pathological changes in the epididymis, dilation of cauda epididymis, formation of sperm cysts and sperm granuloma at the cut ends of the vas deferens, decreased epididymal resorption and alteration in androgen levels (1, 3, 7, 11, 13, 15), the others reported that it has no side effect on the reproductive system (7, 11, 16, 17). Our previous studies on vasectomy revealed (7) the sparing of testicular carbohydrates with lipid mobilization into its metabolism. However, there is no information on the overall changes in the lipid profiles of sex accessory organs and non-reproductive tissues in vasectomized rats. Hence an attempt has been made in the present study to evaluate the possible side effects of vasectomy on the tissue lipid profiles of the animal.

Healthy Wistar strain albino rats ( $145 \pm 2$  days old,  $250 \pm 5$  g body wt) were used for the present study. First group of rats were subjected to bilateral vasectomy by conventional method (9, 14). The second group of rats were sham-operated and taken as controls. The rats were maintained in good laboratory conditions. After six months of vasectomy all the rats were sacrificed by cervical dislocation and at autopsy tissues were isolated for biochemical assays. The total lipids (6), phospholipids (4), triglycerides, free fatty acids and cholesterol (12), glycerol (5) and lipase activity (10) were estimated by the methods given in the parenthesis.

The observed elevation in epididymal total lipid content of vasectomized rats was indicative of either decreased lipolysis or stepped up lipogenesis. In spite of increased lipase activity, elevated levels of triglycerides and phospholipids suggest the possible elevation of tissue lipogenesis. Consequent on such an increase in the lipolysis, the glycerol content was decreased, which might be due to its utilization into tissue glycolysis through  $\beta$ -glycerophosphate pathway (8). The free fatty acid content was elevated suggesting the increased lipolysis. The cholesterol content of the tissue was markedly

TABLE 1 : The levels of total lipids, triglycerides, glycerol, free fatty acids, phospholipids, cholesterol (mg/g, wet wt) and the activity level of lipase ( $\mu\text{mol}$  PNPA formed/mg protein/h) in control and vasectomized rats.

S. No.	Component	Epididymis		Liver		Dorsal aorta		Serum	
		Control	Experimental	Control	Experimental	Control	Experimental	Control	Experimental
1.	Total lipids	92.91 $\pm 1.73$	108.76* $\pm 2.01$	62.14 $\pm 2.86$	87.62* $\pm 2.38$	36.81 $\pm 1.43$	46.00* $\pm 3.02$	408.40 $\pm 38.74$	516.84* $\pm 32.43$
2.	Triglycerides	19.46 $\pm 1.42$	23.73* $\pm 1.02$	2.05 $\pm 0.30$	3.86* $\pm 0.72$	1.13 $\pm 0.27$	2.06* $\pm 0.44$	27.62 $\pm 0.81$	38.63* $\pm 2.14$
3.	Phospholipids	27.06 $\pm 2.43$	38.78* $\pm 2.41$	33.79 $\pm 2.99$	18.37* $\pm 1.14$	12.72 $\pm 2.46$	5.48* $\pm 1.01$	36.00 $\pm 3.10$	48.31* $\pm 3.33$
4.	Lipase activity	0.618 $\pm 0.02$	0.969* $\pm 0.004$	0.17 $\pm 0.004$	0.23* $\pm 0.01$	0.410 $\pm 0.01$	0.486* $\pm 0.018$	—	—
5.	Free fatty acids	26.13 $\pm 1.07$	32.01* $\pm 1.87$	11.86 $\pm 1.01$	17.08** $\pm 1.16$	13.72 $\pm 1.48$	14.03** $\pm 1.11$	23.01 $\pm 0.92$	28.84* $\pm 1.32$
6.	Glycerol	0.836 $\pm 0.03$	0.337* $\pm 0.002$	0.86 $\pm 0.05$	1.32* $\pm 0.04$	0.946 $\pm 0.121$	1.426* $\pm 0.086$	2.72 $\pm 0.14$	5.17* $\pm 0.08$
7.	Cholesterol	2.151 $\pm 0.06$	11.68* $\pm 0.08$	4.9 $\pm 0.26$	8.4* $\pm 0.62$	3.46 $\pm 0.472$	15.84* $\pm 1.79$	39.3 $\pm 3.1$	90.30* $\pm 2.00$

Note : Mean  $\pm$  S.D. ; Values are mean of six individual observations. 'P' denotes the level of significance.

\*P < 0.001

\*\*NS

elevated after vasectomy suggesting the possible impairment in the androgen production of the tissue. Besides epididymis was accumulating large quantities of testicular fluid and hence increased cholesterol level of epididymis might also be partly due to accumulated testicular fluid. Higher cholesterol content in this tissue can be suggestive of impaired function of epididymal tissue (18). The phospholipid content was markedly elevated suggesting that the vasectomized animal epididymis was actively involved in the synthesis of phospholipid fractions. Since phospholipids were known to be associated with active transport mechanism and bio-synthetic activities (7), their increase in epididymis was suggestive of possibility of increased synthetic activities of the tissue with promoted active transport processes.

The tissues such as liver, dorsal aorta and serum had decreased phospholipid content with accumulation of triglycerides inspite of elevated lipase activity suggesting the possible conversion of this compound into glycerides. The elevated cholesterol content of the tissues and serum indicates the active addition of this compound into

blood from the synthetic sites. Liver, kidney and adrenals actively synthesize cholesterol (8), and its accumulation in liver and dorsal aorta suggested an accelerated accumulation of this compound in the tissues after vasectomy. This observation was inconsonant with earlier reports where the elevated cholesterol content on vasectomy was associated with cardiovascular disorders and atherosclerosis (2, 3). The weight of the rats was elevated after vasectomy and this supports the earlier findings (13).

Hence in general it can be concluded that the tissues of vasectomized rats seem to have stepped-up lipogenesis leading to accumulation of lipid fractions which could be responsible for obesity of animals.

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