

# EFFECT OF VASECTOMY ON BIOCHEMICAL CONSTITUENTS OF THE BLOOD IN LANGUR MONKEY - A 2½ YEARS FOLLOW UP

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**Summary :** Bilaterally vasectomized langur monkeys were compared with age matched sham operated controls for biochemical constituents of the blood following 1.5, 2.0 and 2.5 years of surgery. No appreciable changes were observed in blood glucose and blood urea and serum total protein, total lipid, phospholipid, total cholesterol, sialic acid, electrolytes (chloride, phosphorus, magnesium, sodium, potassium, copper and zinc) and enzymes (LDH, alkaline phosphatase, SGOT and SGPT) suggesting that long-term vasectomy does not cause adverse effects on general body metabolism including atherosclerosis.

**Key words :** blood                      biochemical constituents                      vasectomy                      langur monkey

## INTRODUCTION

Adverse effects of vasectomy on general health have been gaining increasing concern during the past 3-5 years. Possibility of increased risk of atherosclerosis in long-term vasectomized rhesus and cynomolgus monkeys (2, 8) and rabbits (16), altered serum concentrations of proteins in rhesus monkeys (1) and isolated report of metabolic disorders in men (17) raised the possibility of vasectomy effects on blood composition in long-term subjects. The present investigation deals with long-term vasectomy effects on blood biochemical constituents in langur monkey which has close resemblance with man in its reproductive endocrine profile (13).

## MATERIAL AND METHODS

Twelve adult male langurs, weighing between 14-17 kg, trapped around Jaipur were quarantined for two months, during which semen, blood, urine and stool samples were tested in order to find out their reproductive and multiphasic-health status. Animals were housed individually in metallic cages and fed on wheat chapaties, green vegetables and soaked grams. Water was provided *ad libitum*. Monkeys were anaesthetized with intraval sodium (20 mg/kg, b.wt; i.v.). Six animals were subjected to bilateral vasectomy and remaining six were sham operated under sterile conditions. Efficacy of the procedures was judged by semen analysis.



Blood samples were collected from saphenous vein following 1.5, 2.0 and 2.5 years of surgery. Blood glucose (6) and blood urea (5) and serum sialic acid (21), total protein (12), total cholesterol (23), total lipid (18), phospholipid (22), chloride, phosphorus, magnesium, sodium, potassium, copper, zinc, LDH, -GOT, -GPT and alkaline phosphatase (14) were estimated. Student's "t" test was applied for statistical analysis.

### RESULTS

No appreciable changes were observed in blood glucose, blood urea and serum total protein, total lipid, phospholipid, total cholesterol and sialic acid levels at 1.5, 2.0 and 2.5 years of vasectomy as compared with sham operated controls (Fig. 1). Serum electrolytes i.e. chloride, phosphorus, magnesium, sodium, potassium, copper and zinc levels were statistically unchanged (Fig. 2). Serum LDH, alkaline phosphatase, -GOT and -GPT did not show any significant shift from sham operated control range (Fig. 3).

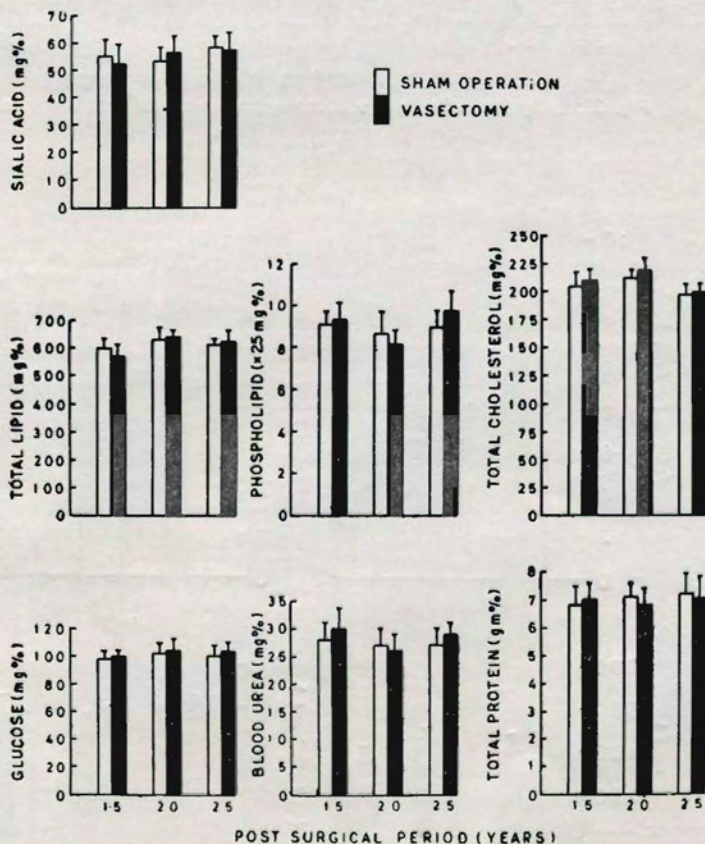


Fig. 1 : Long-term effects of vasectomy on blood glucose, blood urea, total cholesterol, total lipid, phospholipid, total protein and sialic acid levels.



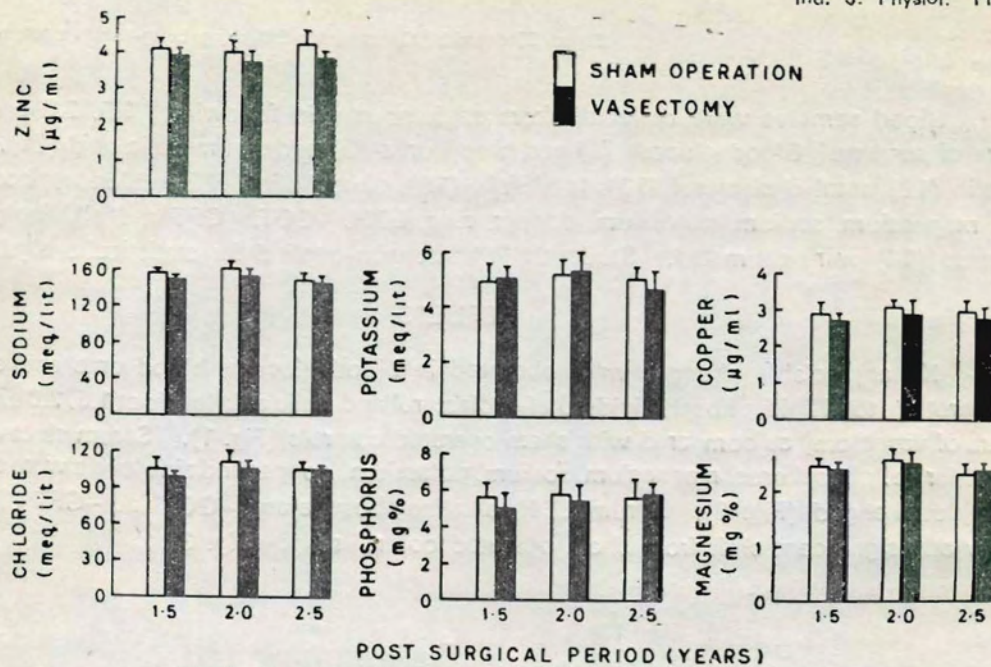


Fig. 2 : Long-term effects of vasectomy on serum electrolyte levels.

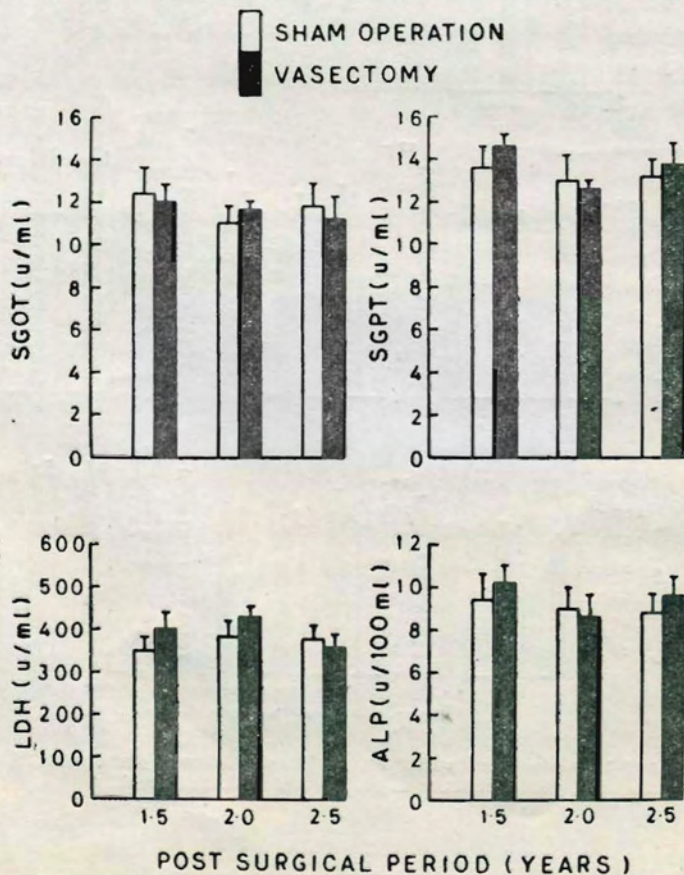


Fig. 3 : Long-term effects of vasectomy on serum LDH, GOT, GPT and alkaline phosphatase levels.



## DISCUSSION

Blood urea levels alter in renal dysfunction, nephritis, acute nephrotoxicity and prostatic obstruction. The possibility of glomerulonephritis and other genitourinary diseases have been recorded in long-term vasectomized men (19). An elevated uric acid levels due to increased resorption of nucleic acid have also been noticed in vasectomized men (11), in contrast to unchanged blood urea levels in vasectomized langur monkeys (4, 15). Alexander (1) reported increased globulin and decreased albumin with a significant drop in A/G ratio in vasectomized rhesus monkeys. Contrary serum protein did not change in present study suggesting an unaltered protein metabolism (3).

Serum cholesterol fluctuates in liver diseases, atherosclerosis and hyper or hypothyroidism. An enhanced plasma cholesterol levels have been noticed in vasectomized rhesus and cynomolgus monkeys (20) and rabbits (16) suggesting increased possibility of atherosclerosis. Unchanged total cholesterol, total lipid and phospholipid ruled out such possibilities in langur monkeys (3, 4, 15). Unaltered lipid constituents in present investigation might be due to species specificity of vasectomy effects.

Alexander *et al.* (3) reported a significant increase in potassium and chloride but not in phosphorus constituents in antibody positive vasectomized men. Contrary rhesus monkeys showed no significant change in sodium, potassium, chloride and phosphorus levels after long-term vasectomy (4). Similarly Capel *et al.* (7) described no effect on serum copper and zinc levels after vasectomy in rats which is in accordance with present findings in vasectomized langur monkeys suggesting unaltered kidney function.

Alexander and Tung (4) noticed no change in serum LDH, alkaline phosphatase and transaminase (SGOT) for 13 years of vasectomy in rhesus monkeys. An unaltered serum LDH, alkaline phosphatase and transaminases (SGOT and SGPT) levels have also been observed in ten or more years vasectomized men (15). Contrary thrombophlebitis, liver dysfunction, arthritis, recurrent infection, multiple sclerosis, hypoglycemia and diabetes mellitus have been noticed in long-term vasectomized men (9, 10, 17). No shift in LDH, SGOT, SGPT and alkaline phosphatase levels in present investigation (4, 15) suggest that long-term vasectomy does not cause any adverse effect on general body metabolism including possibilities of increased atherosclerosis.

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