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## **Inhibited Thyroid Function, Impaired Lipid Metabolism and Increased Tissue Oxidative Stress in Rats Native to High Altitude**

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**Objective:** To evaluate the effect of high altitude on markers of thyroid function, serum lipid profile and tissues oxidative stress in male Wistar rats native to high altitude (HA) with male rats native to low altitude (LA).

**Design:** Randomized experimental animal study.

**Setting:** Physiology laboratory, Medical School of King Khalid University.

**Method:** Male rats aged six months, weighing 250 gm were bred and maintained at low altitude (LA, 600 m above sea level, n=6) or high altitude (HA, 2800 m, n=6), under the same laboratory conditions and fed the same diet. Blood samples were obtained for thyroid hormones and lipid profile analysis. Livers, kidneys, lungs and testes were collected and used for determination levels of thiobarbituric acid reactive substances (TBARS), reduced glutathione (GSH), Superoxide Dismutase (SOD) and Catalase Activity (CAT).

**Result:** HA rats had significantly ( $P < 0.05$ ) lower serum T3 (17.14%), T4 (13.75%), TSH (39.29%) and total cholesterol (15.84%) and LDL (60.90%). There were no significant differences in TAG or HDL. All tissues from HA rats showed significant decreases in SOD and CAT activities compared to LA rats. These rats showed significantly higher oxidative stress in the lungs and the liver, but lower oxidative stress in the kidney and no difference in the testes.

**Conclusion:** Living at high altitude environment results in impaired thyroid function and lipid metabolism and causes increased tissue oxidative stress.

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