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Effects of Hemicastration or hCG-treatment on Steroids in Testicular Vein and Jugular Vein Blood of Stallions

RUPERT P. AMANN [1] AND VENKATASESHU K. GANJAM [1]

[1] *Animal Reproduction Laboratory, Department of Physiology and Biophysics, Colorado State University, Fort Collins, Colorado; and the Section of Clinical Reproduction, School of Veterinary Medicine, University of Pennsylvania, Kennett Square, Pennsylvania*

The relationships among testicular vein and jugular vein concentrations of androgens and estrogens were studied in anesthetized stallions. Blood was sampled from a vein on the surface of the testis and simultaneously from an artery on the surface of the testis and from the jugular vein. Concentrations of total 17β-hydroxy-androgens and total estrogens were measured for all samples and testosterone, dihydrotestosterone, 3α-andostanediol, 3β-androstanediol, and 5-androstenediol were quantified in selected samples. Following halothane anesthesia and hemicastration of 19 stallions, the testosterone concentration in jugular blood dropped over 3 hours but returned to normal within two days. Although jugular levels of total 17β-hydroxy-androgens were normal (~1.4 ng/ml) 12 days after hemicastration, the concentration of total 17β-hydroxy-androgens in testicular vein blood was sixfold greater ($P < 0.01$) than it had been at hemicastration (368 vs 62 ng/ml). The ratio of testosterone to 5α-reduced-androgens was similar in testicular vein blood from the first and second testes. Apparently, the clearance rate for testosterone had changed from ~2.4 l/min/ stallion to ~6.2 l/min/stallion in 12 days. Concentrations of total estrogens in testicular vein blood were similar for the first and second testes (27,400 pg/ml) as compared with the values for jugular vein and testicular artery blood (63 and 293 pg/ml, respectively). Clearance rate of estrogens (~23.3 l/min in intact stallions) apparently decreased by 50%. Although anesthesia plus hemicastration may have altered blood flow to the remaining testis, a change in blood flow could not account for the concurrent increase in testosterone and decrease in estrogen clearance rates. Injection of 1500 IU of hCG markedly increased ($P < 0.01$) the concentration of total 17β-hydroxy-androgens in testicular vein blood 1 hour later, but the concentration of total estrogens was unaltered 1 or 2 hours after treatment. We concluded that the concentrations of total 17β-hydroxy-androgens and total estrogens in jugular blood bear little relationship to their concentrations a few minutes earlier in venous blood draining the testis.

Key words: stallion, androgens, estrogens, testicular vein, hemicastration, hCG-treatment

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