Concentrations of Testosterone and Estrone Sulfate After Castration and After Human Chorionic Gonadotropin Stimulation in Stallions

Alejandro Esteller-Vico, DVM, PhD*; Jessalyn C. Walter, BS; Sydney E. Hughes, BS, MS; Edward L. Squires, PhD, Diplomate ACT; Mats H.T. Troedsson, DVM, PhD, Diplomate ACT, ECAR; and Barry A. Ball, DVM, PhD, Diplomate ACT

After castration, testosterone and estrone sulfate reached castrate levels after 24 hours. After human chorionic gonadotropin (hCG) stimulation, the largest increase in testosterone concentrations were at 48, 72, and 96 hours, compared with pre-stimulation levels. Authors' address: Gluck Equine Research Center, Department of Veterinary Science, University of Kentucky, Lexington, KY 40546; e-mail: aestellervico@uky.edu. *Corresponding and presenting author. © 2013 AAEP.

1. Introduction

Human chorionic gonadotropin (hCG) stimulation is used in suspected cases of cryptorchidism and to assess testis function in stallions. Basal testosterone and estrone sulfate concentrations are used as markers of testicular tissue and to ensure complete castration. To the author’s knowledge, the half-lives of these hormones are not reported for the horse, and the best time points to sample after hCG stimulation are controversial. The objective of this study was to determine (1) half-lives of endogenous testosterone and estrone sulfate after castration and (2) testosterone concentration after hCG stimulation.

2. Materials and Methods

Pony stallions (n = 8; age ≥2 years) were randomly assigned to control (5 mL of saline) or treatment groups (5000 IU hCG IV). Blood samples were drawn at 0, 1, 2, 6, 12, 24, 48, 72, and 96 hours. Stallions were castrated, and blood samples were drawn at 0, 1, 2, 3, 4, 5, 6, 8, 10, 12, 24, 36, 48, 72, 96, and 120 hours after castration. Estrone sulfate and testosterone were determined through the use of an enzyme-linked immunosorbent assay. Repeated-measures analysis of variance and exponential decay analyses were used.

3. Results and Discussion

Testosterone concentrations were significantly greater at 1, 12, 24, 48, 72, and 96 hours after hCG, compared with pre-stimulation values. The largest increases from baseline were at 48, 72, and 96 hours, which indicates that later sampling times may better identify the presence of testicular tissue. Half-lives of testosterone and estrone sulfate were 1.1 and 0.7 hours after castration, respectively, and both hormones reached castrate levels by 24 hours after castration.

Acknowledgments

This research was supported by the Albert Clay Endowment in equine reproduction at the Gluck Center, by the Department of Veterinary Science, and by the Paul Mellon Postdoctoral Scholarship, University of Kentucky.