

EFFECTS OF REPEATED HUMAN CHORIONIC GONADOTROPIN
ADMINISTRATION ON SERUM TESTOSTERONE AND TESTICULAR
VOLUME IN PREPUBERTAL THOROUGHBRED COLTS

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Testicular descent in the normal equine colt occurs between 300 days of gestation and 10 days after birth. Cryptorchidism is a common developmental defect in boys and the horse in which one or both testicles fail to descend into the scrotum. Human Chorionic Gonadotropin (HCG) is routinely used in prepubertal boys to facilitate testicular descent of inguinally retained testes. The goal of this study was to determine the effect of repeated HCG administration to prepubertal colts on testosterone production and testicular volume and, in particular, to: (1) assess the endocrine response of prepubertal colts to repeated HCG administration; (2) determine if HCG treatment results in alterations in testicular volume. Twelve thoroughbred colts, 180–200 days of age were randomly assigned to two treatment groups. Group 1 ($n = 66$) received 2500 IU HCG (Chorulon, Intervet, Milboro, USA) IM $2 \times$ weekly for four weeks for a total of eight treatments. Group 2 ($n = 66$) received saline 2.5 ml IM $2 \times$ weekly. Serum testosterone concentrations were measured by RIA from blood samples collected immediately prior to each treatment and at 2, 24, 48 and 72 h after treatment. Prior to initiation of treatment, at weekly intervals during treatment and one week after the last treatment, colts were tranquilized and testicular volume determined by ultrasonographic measurements using the formula, $\text{volume} = 3.14 \times D^2/4 \times L \times 0.9$. Testosterone concentrations and testicular volume were compared between treatment groups by Kruskal–Wallis one-way nonparametric AOV. Significance was set at $p < 0.05$. Testosterone concentrations in all colts were below the level of detection of the assay prior to initiation of treatment (<9.163 pg/ml). All colts treated with HCG responded with significant increases in testosterone concentrations by 48 h post-treatment (9.163 pg/ml versus 111.2 pg/ml). Testosterone concentrations in the saline treated colts did not show any increase over the treatment interval. Peak testosterone response to HCG treatment did not differ between the first treatment and the last treatments (111.2 pg/ml versus 234.4 pg/ml). Mean testicular volume was greater ($p = 0.30$) in HCG treated colts following treatment (16.4 cm^3 versus 22.6 cm^3). No increase in volume was observed in saline treated colts. These results demonstrate that prepubertal colts are capable of responding to HCG stimulation with increased testosterone production comparable to adults. No decrease in response to HCG stimulation was observed with repeated administrations. The increase in testicular volume in HCG treated colts offers a possible mechanism for the efficacy of HCG treatment for facilitation of testes descent reported in boys. Additional studies are required to determine if early intervention improves subsequent fertility in effected colts.

Keywords: Stallion; Prepubertal; HCG; Testosterone; Testicular volume