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JOURNAL ARTICLE

Seasonal effects on seminal quality, plasma hormone concentrations, and GnRH-induced LH response in fertile and subfertile stallions

J. F. Roser and J. P. Hughes
Department of Animal Science, College of Agriculture and Environmental Sciences, University of California, Davis 95616.

Seasonal effects on hormonal and seminal parameters in subfertile stallions have not been well documented and could provide information that is needed to understand the underlying endocrine mechanisms associated with testicular dysfunction. Such information may be useful in developing diagnostic tools to identify those stallions who are candidates for treatment. This investigation characterizes and compares the effects of season on endocrine function and seminal quality in fertile and subfertile stallions. Eight fertile and six subfertile stallions between the ages of 5 and 18 years were injected intravenously once every hour for 3 hours with either 1 mL saline on the first experimental day or 5 micrograms gonadotropin-releasing hormone in 1 mL saline on the second experimental day during the nonbreeding and breeding season. Heparinized blood samples were collected periodically through a jugular catheter before and after treatment for analysis of luteinizing hormone, follicle-stimulating hormone, testosterone, and estrogen conjugates by radioimmunoassay. Semen samples were collected twice, 1 hour apart, from all stallions in both seasons for analysis of volume, concentration, motility, pH, and morphology. A series of low intravenous doses (5 micrograms) of gonadotropin-releasing hormone induced a significant luteinizing hormone response (P less than 0.05) compared with saline treatment in both fertile and subfertile stallions. Fertile stallions had a twofold higher (P less than 0.05) net increase in plasma luteinizing hormone levels (peak levels minus baseline levels) in the breeding seasons than in the nonbreeding season. The magnitude of the luteinizing hormone response relative to baseline levels in fertile stallions, however, was one-and-one-half times greater (P less than 0.05) in the nonbreeding season than in the breeding season. In contrast, season did not have an effect on the net increase in plasma luteinizing hormone or the magnitude of the luteinizing hormone response relative to baseline levels in subfertile stallions. The net increase in plasma luteinizing hormone was similar between the two groups of stallions in both seasons. The magnitude of luteinizing hormone response relative to baseline levels, however, was lower (P less than 0.05) in subfertile stallions (141 +/- 14%) than in fertile stallions (235 +/- 46%) in the nonbreeding season; the two groups exhibited similar responses in the breeding season. Compared with fertile stallions, subfertile stallions had twofold to fourfold higher (P less than 0.05) plasma levels of gonadotropins and similar testosterone levels. The number of total progressively motile sperm was lower (P less than 0.05) in

subfertile stallions in both seasons.(ABSTRACT TRUNCATED AT 400 WORDS)
