

Serum progesterone and progestogen concentrations in hospitalized pregnant mares

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The objective of this study was to monitor serum progesterone and its metabolites in ill and healthy pregnant mares and to determine the influence of exogenous progestin, or progesterone on hormonal concentrations during hospitalization.

Blood samples were collected daily from 56 pregnant mares during hospitalization period. Affected systems were digestive (n= 37), locomotor (n= 5), respiratory (n=7), and others (n=7). In addition 27 pregnant healthy mares in respective gestation stages were used as contemporary controls. An oral active synthetic progestin (17 α -Allyl-17 β -hydroxyestra-4,9,11,13-tetraen-3-one; Regu-Mate[®]) and progesterone in an oil vehicle were used in 45 and 10 pregnant mares respectively as part of medical treatment during hospitalization. Mares were categorized into 5 groups: less than 40 days, 41 to 120 days, 121 to 185 days, 186 to 285 days, and more than 286 days of gestation. Progesterone (P4) concentrations via radioimmunoassay were determined by Coat-a-count (DPC; Los Angeles, CA) as well as with an in-house validated RIA. Qualitative and quantitative serum progestogens (n=7) were determined by gas chromatography/mass spectrometry (GC/MS). Data were analyzed using Proc Mixed in SAS (version 8.1).

As expected, progesterone (p<0.01) and progestogen (p<0.05) concentrations changed across gestation stages. The following progestogens: 3 β -hydroxy-5 α -pregnan-20-one (3 β 5 α DHP), 5 α -pregnane-3 α ,20 α -diol($\alpha\alpha$ -diol), 5 α -pregnane-3 β ,20 α -diol($\beta\alpha$ -diol), and 20 α hydroxy-5 α -pregnane-3-one (20 α -5p) were higher (p<0.05) in ill than healthy mares from 186 to 285 days. However, a lower progesterone concentration (P<0.05, by RIA's) was found in pregnant ill mares than in healthy mares that were less than 40 days of gestation.

Hormonal concentrations were not significantly different in ill mares when Regu-Mate[®] therapy was administered between 186 and 285 days. However, ill mares treated with progesterone in oil exhibited a trend for higher P4; there was a tendency of reduction in some specific progestogens between 121 and 285 days of gestation.

Pregnancy outcome was characterized by 42 normal foalings and 9 abortions, with 5 mares requiring euthanasia (n=3) or dying (n= 2). Progesterone concentrations decreased (p= 0.02) during hospitalization period in mares that aborted but significant changes were not observed in mares that had a normal foaling. Progesterone, 20 α -5p and 3 α 5 α DHP concentrations were significantly lower in mares that aborted than in mares that had a normal foaling.

Key words: Mare, Progesterone, Progestogens, Abortion and Pregnancy.