Biochemical markers of bone turnover during pregnancy in horses: a longitudinal study

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Abstract

The effect of pregnancy on bone metabolism was investigated in healthy mares. Venous blood samples were collected 7 times from 19 multiparous mares starting at 20-weeks pre-parturition, continuing 6 times in 4-week intervals, including the week of parturition and one week after parturition. Serum concentrations of osteocalcin (OC) and carboxy-terminal cross-linking telopeptide of type I collagen (CTX-I) were determined. Measurement cycles and age had a significant (p < 0.01) influence on OC and CTX-I values. Pregnancy influenced bone metabolism with peak bone formation and resorption values around the time of parturition.

Key words: Horse, pregnancy, bone, osteocalcin, CTX-I

Introduction

The effect of pregnancy on the maternal skeleton was studied in women and in various animal species (Kritz-Silverstein et al. 1992, Liesegang et al. 2007). Despite the importance of this subject concerning sport, breeding and milk producing mares, information regarding pregnancy associated changes in bone metabolism is still missing in horses. This study evaluates the effect of pregnancy on biochemical bone markers in mares.

Materials and Methods

19 clinically sound Haflinger mares, aged 4 to 16 years (8.05 ± 4.01 years), were included in the study (Nov 2008 and April 2009). The mares had a history of one to 12 pregnancies (4.37 ± 3.49 pregnancies). They were vaccinated (tetanus, equine influenza, equine herpes virus 1 and 4) and dewormed. They were held in a herd on a pasture from April to October, thereafter in a paddock-pen. Feeding was ad libitum grass, respectively straw and hay, as well as...