



IGF-I CONCENTRATION IN THE BLOOD OF FOALING MARES DURING THE LACTATING PHASE WITH SPECIAL REGARD TO POSTPARTAL FERTILITY



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INTRODUCTION

Insulin-like growth factor I (IGF-I) is a peptide hormone that has been shown to be involved in metabolic regulation of growth and reproduction in livestock species (1). The IGF-I is mainly but not exclusively produced in the liver and is associated with specific carrier proteins in blood (2). Several studies implicate IGF-I of peripheral origin as a putative metabolic signal to the hypothalamo-pituitary axis (3). Circulating levels of IGF-I are elevated at puberty in rodents, ruminants and primates (4-6). IGF-I has a positive correlation with energy and protein metabolism (7). In mares, concentration of IGF-I in plasma increased during late pregnancy, peaked 2 days after parturition, and then gradually declined until weaning (8). The aim of this study was to follow up the postpartal IGF-I concentration in the blood of foaling mares with different body measures in correlation to their later fertility.

MATERIALS AND METHODS

22 lactating warm-blood mares from a large stud farm were used in this study. Feeding: mainly pasture + 2,5 kg oats + 1,5 kg concentrate. Stable: additionally 4 kg corn silage + 3 kg hay. Blood samples, weight and height of mares were taken from the day of foaling every two weeks until the time of weaning. IGF-I in blood serum was determined by an enzyme immunoassay developed by M. Hennies (Institute of Physiology, Biochemistry and Hygiene of Animals, Bonn) on the basis of the IGF binding protein blocked method for the radioimmunoassay by Blum and Breier (9).

RESULTS

The serum IGF-I concentrations were significantly ($P < 0.05$) higher in the mares with normal postpartal fertility than in mares with postpartal fertility disturbance (Figure 1). IGF-I concentrations in the mares with normal fertility varied significantly ($P < 0.01$) according to the weight and height of mares (Figure 2 & 3).

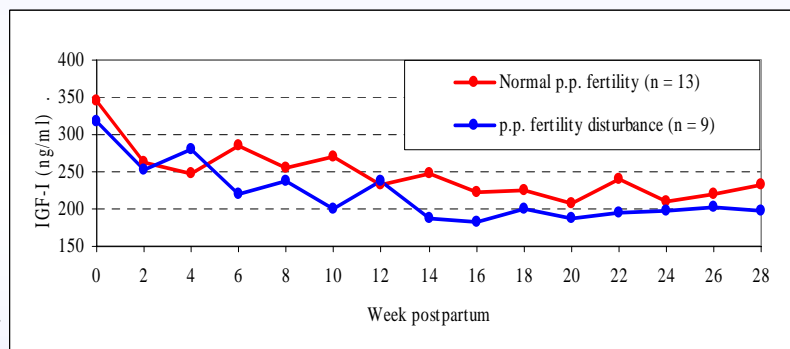


Figure 1: IGF-I concentrations in the mares with normal fertility and fertility disturbance.

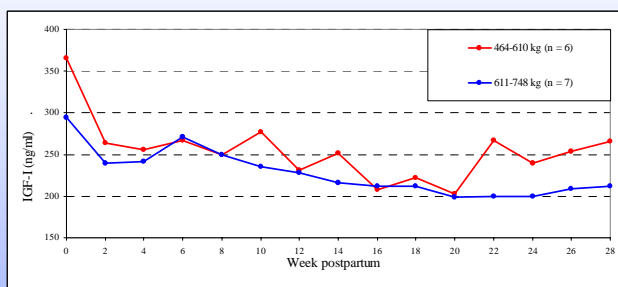


Figure 2: IGF-I concentrations according to the weight (fertile mares).

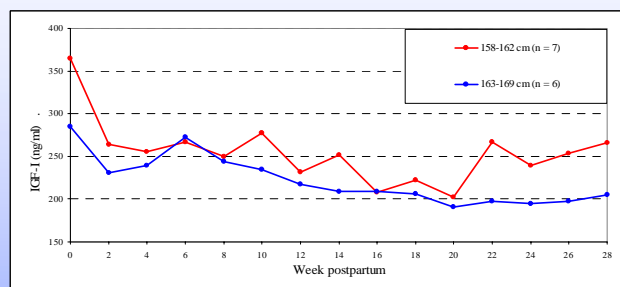


Figure 3: IGF-I concentrations according to the height (fertile mares).

CONCLUSION

We conclude that, during the lactating phase, the mares with normal reproductive performance and the mares with lower height and weight were apparently in a more anabolic state of metabolism and a better balance of energy, which favour a successful reproduction. Therefore foaling mares with high body measures at first require a special care to bring them as accurately as possible near a balance state of metabolism and secondly to optimize all the other factors, which guarantee a successful reproduction. The results also confirm observations during the practical fertility control, that mares with high body measures not seldom have fertility problems (10).

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