PREGNANCY-ASSOCIATED GLYCOPROTEIN CONCENTRATIONS DURING PREGNANCY AND POSTPARTUM PERIODS IN ZEBU CATTLE

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INTRODUCTION

- In the last two decades, a highly polymorphic family of placenta-expressed proteins has been discovered in ruminant species. These pregnancy-associated glycoproteins (PAGs) constitute a large family of aspartic proteinases, showing a greatest sequence identity with pepsinogens (Xie et al., 1991).
- PAGs are synthesized by mono and/or binucleate trophoblastic cells, some of them being released in maternal circulation during almost the whole pregnancy period.
- By using biochemical procedures, some molecules of the PAG family were isolated from cotyledons of cows, ewes and goats. These molecules were used to immunize rabbits and the antisera obtained allowed the development of homologous and heterologous RIA systems for PAG measurement in plasma, serum (Zoli et al., 1992) or milk samples (González et al., 2001).
- In the present work a specific RIA for zebu pregnancy-associated glycoprotein (PAG) was used to measure PAG concentrations during gestation and postpartum periods in 12 Azawak zebu cows.

MATERIALS AND METHODS - SAMPLES

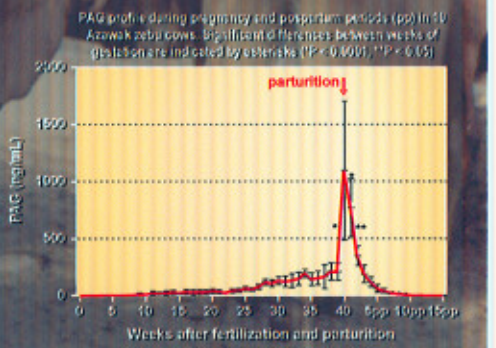
- Twelve regularly cycling Azawak zebu cows of mixed age and parity were used in this study.
- Heparinized blood samples (5 mL) were taken weekly from the jugular vein during gestation and postpartum periods.
- Plasma was removed by centrifugation (1500 x g for 15 min) immediately after collection and stored at -20°C until assayed for PAG.

MATERIALS AND METHODS - PAG RIA

- Plasmatic concentrations of zebu PAG were measured with a homologous double-antibody RIA system.
- A pure preparation of zebu PAG (0.08 M NaCl fraction of DEAE Sephadex A25 column, CM Ceramic column peak IX) was used as standard and tracer.
- A rabbit antiserum (R782) raised against the same preparation was used as the first antibody at a final dilution of 1:750 000.

RESULTS

- Eleven Azawak zebu cows were diagnosed as pregnant by rectal palpation of the uterus. In the non-pregnant cow, the PAG concentrations remained lower than the assay sensitivity (<0.2 ng/ml).
- One of the 11 pregnant females showed abnormally high (Dagnelies, 1975) PAG concentrations during gestation, being excluded from the general PAG profile.



- During pregnancy, mean weekly PAG concentration varied significantly among the animals ($P<0.0001$) and the periods of pregnancy ($P<0.0005$). However, the time-related variation on PAG concentration was significant only at the end of gestation.
- The mean PAG concentration (Figure 1) increased progressively from the week 6 to the 35 week of gestation (from 6.0 ± 4.2 ng/ml to 196.0 ± 34.8 ng/ml). Thereafter, PAG concentrations remained relatively constant until week 39 (210.8 ± 74.8 ng/ml), then they increase significantly reaching its highest level (1 095.6 ± 607.2 ng/ml) at parturition (week 40). After delivery, plasma PAG concentrations declined significantly ($P<0.05$) till the week 2 postpartum (348.4 ± 85.6 ng/ml). Thereafter, PAG concentrations decreased slowly reaching undetectable levels at the week 13 postpartum.

CONCLUSIONS

To conclude, our findings showed that peripheral PAG concentrations in Bos indicus cattle were very similar to those previously described in Bos taurus (Zoli et al., 1992), with significant higher concentrations being observed at the end of gestation followed by a slow decline in the postpartum period.

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