Fused placentomes development in bovine placenta

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Introduction

For many years the placenta of animals has stimulated the curiosity among researchers. Currently many techniques are used to analyze its structure. Being a transitory organ, the placenta is very dynamic and mutable, being difficult to accurately measure, especially when considering groups of different gestational stages. Placentome formation begins with trophoblast growth and they show various fusion degrees (1, 2, 3). The current study has the objective to analyze the region of the placentome fusion during gestation and its cellular contribution to placental development among non-manipulated cows.

Material and Methods

28 uteri from non-manipulated bovine pregnancies were obtained from a slaughterhouse in Sao Jose dos Campos – SP. Samples of placentome fusions were collected and put under liquid nitrogen to determinate the cell cycle stage through flow cytometry. These cells were separate in pH 7.6 citrate buffer and processed according to the (4) technique.

Results and Discussion

As seen in Fig. 1, the placentome fusion showed a higher number of cells in proliferative activity (G2/M phase) and apoptosis on the last gestational group (12.1% ± 9.0 and 11.4% ± 9.0) in comparison to group II (5.4% ± 3.4 and 3.5% ± 0.7). Both cellular proliferation and apoptosis have an important role in placental function and are inversely proportional during gestation (5). However, the placentomal fusion showed equilibrium in proliferative and apoptotic cell proportions throughout gestation, characteristic of connective tissue. According to (6) cell proliferation indicates that they are part of the concepts nutrition; being so, in a gestational moment when the fetus is already fully developed and duo to leave the uterine cavity, there is no physiologic reason in continuing the proliferative process. The equilibrium in proliferative and apoptotic cells found in placentomal fusions indicates that this region propitiates the maternal-fetal maintenance, but has no role in placental maturation and releasing.

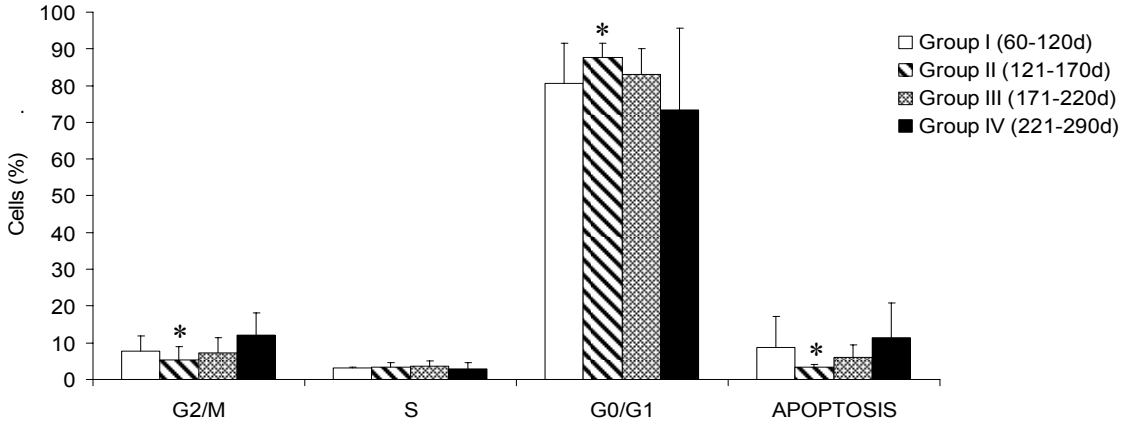

Figure 1. Placentome fusion cell distribution on cellular cycle stages, during gestation. *P<0.05: group II *vs.* group IV.

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Timing of post-ovulatory progesterone rise and luteolysis in Colombian Sanmartinero cows

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Introduction

Importance of luteal function during early pregnancy has been well established (1). A delayed rise in post-ovulatory progesterone is associated with poor embryo development. Colombian native breeds of cattle have shown adaptation to the environmental conditions in tropics, in terms of reproductive performance (2,3,4). The aim of this study was to describe the post-ovulatory progesterone rise and its decrease after luteolysis during the estrous cycle in Sanmartinero cows.

Materials and Methods

15 suckling cows were studied during consecutive estrous cycles after postpartum onset of cycling. Blood samples were taken three times a week and progesterone levels were measured by radioimmunoassay.

Results and Discussion

Estrous cycle duration was 20.95 ± 1.99 days, with maximum progesterone levels of 10.23 ± 2.45 ng/ml on day 15 (Fig. 1). Basal progesterone levels under 0.5 ng/ml were found until day 3 post-ovulation, as found in other Colombian native breeds (2,3,4), after day 3 post-ovulation progesterone steadily increases at a constant rate until reaching its maximum level. Percentage of variation on progesterone levels between each sampling day regarding the previous one are shown on Fig. 2. Suprabasal progesterone levels were seen in connection with extended growth of preovulatory follicle in repeat-breeder animals (5). On the other hand, a high decrease on progesterone levels (49.44%) was presented between day 17 and 19, when luteolysis occurs. There is evidence that increased time from luteolysis to ovulation is associated with delayed progesterone increases after ovulation (1).

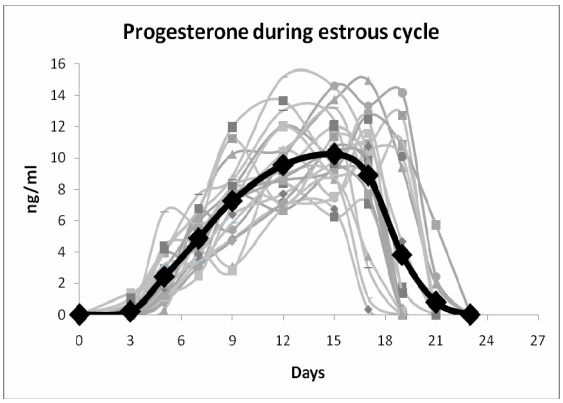

Figure 1. Average progesterone levels

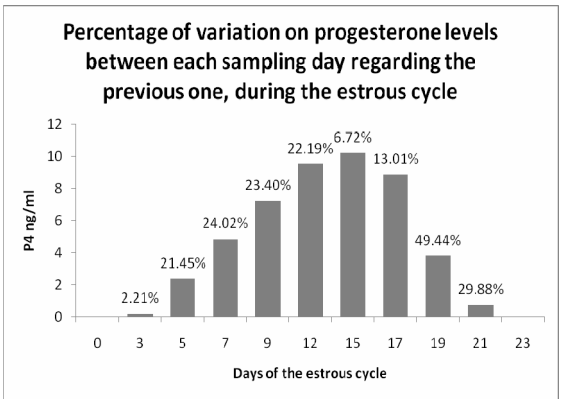

Figure 2. Percentage of variation on progesterone levels.

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