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Influence of sub-clinical endometritis on early pregnancy predictors and pro-inflammatory cytokines in circulating immune cells in dairy cows

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Resumo

We aimed to evaluate the influence of subclinical endometritis (SCE) and pregnancy status on expression of genes stimulated by interferon (ISGs) and inflammation in circulating immune cells in dairy cows. In Experiment 1, peripheral blood mononuclear cells (PBMCs) were isolated from cows considered healthy or with SCE (n=6/group) on Days 0 (estrus) and 7 (diestrus) of a synchronized estrous cycle. In Experiment 2, on day 21th after a timed-artificial insemination, cows were evaluated by ultrasonography to assess luteal blood perfusion and PBMCs were isolated. Thirty-two days after insemination, cows were classified into: healthy pregnant (n=7), pregnant with SCE (n=4), healthy non-pregnant (n=8), and non-pregnant with SCE (n=10). SCE diagnose was performed by the Cytrobush technique. For classification of SCE occurrence, only cows with $\geq 5.5\%$ of PMN and $\geq 5.0\%$ of PMN were considered with SCE, in Experiment 1 and 2, respectively. Were considered cows without any uterine disease (NUD group), in Experiment 1, $\leq 3.0\%$ of PMN, and , in Experiment 2, cows with $\leq 2.0\%$ of PMN. Gene expression of ISGs (ISG15, OAS1, MX1 and IFI6) and pro-inflammatory cytokines (IL1- β , TNF- α and IFN- γ) were determined. Expression of ISG15, MX1, IFI6, TNF- α and IFN- γ did not differ ($P>0.1$) between SCE and healthy cows and between Days 0 and 7. However, a greater ($P=0.02$) expression of OAS1 (1.4-fold) and IL1- β (19.3-fold) in PBMCs was observed on Day 7 than Day 0. In Exp.2, ISG15 abundance was 2.5-fold greater ($P=0.0008$), TNF- α was 2.2-fold greater ($P=0.05$), and IL1- β tended ($P=0.06$) to be 2.4-fold greater in pregnant than non-pregnant cows. Luteal blood perfusion was greater ($P=0.01$) in pregnant animals. In conclusion, OAS1 and IL1- β are transcripts upregulated in PBMCs at diestrus, regardless of SCE occurrence. Pro-inflammatory cytokines are not affected by SCE occurrence, but IL1- β and TNF- α are upregulated in pregnant animals on day 21th after insemination. ISG15 abundance is a good pregnancy predictor, regardless SCE presence.