Serum and ovarian follicular fluid concentrations of interleukin (IL)-1 beta, glucose, and NEFA in lactating dairy cows with cystic ovarian follicles

T. R. Egan, *BS*[1]; **D.A.V. Acosta**, *DVM, MS*[1,2]; **C. Skenandore**, *BS*[1]; **S. Sulzberger**, *BS*[1]; **M. N. Corrêa**, *DVM, MS, PhD*[2]; **D. French**, *DVM*[1]; **F. C. Cardoso**, *DVM, MS, PhD*[1]
[1]*University of Illinois, Urbana, IL 61801*
[2]*Universidade Federal de Pelotas, Pelotas, Brazil*

© Copyright American Association of Bovine Practitioners; open access distribution.

Introduction

Follicular cysts are an important disorder affecting 5 to 30% of dairy cows that leads to abnormal estrous cycle behavior and economic losses due to infertility. The underlying causes of follicular cysts are not fully understood, and responses to therapeutic strategies have been inconsistent. Therefore, veterinarians face challenges in treating cystic ovarian follicles in dairy cattle. The objective of this study was to evaluate the role of the pro-inflammatory mediator IL-1-beta (IL1B) and select metabolites found in blood and follicular fluid from 2 groups of cows.

Materials and Methods

Lactating dairy cows (n=22) were examined weekly by ultrasound and classified as having large follicles (>25mm; CYS; n=11) or not (cyclic cows; CON; n=11). Follicular fluid was collected via ultrasound-guided transvaginal aspiration. Blood samples obtained concurrently were cooled, then centrifuged to harvest serum/plasma and all samples were frozen until analyzed for non-esterified fatty acids (NEFA), glucose, and IL1B. Statistical analysis was performed using the MIXED procedure of SAS. Cows were at 94.45 (30 to 382) days-in-milk, yielding 83.6 ± 26.5 lb (37.9 ± 12 kg) of milk per day, and parity 2.6 ± 1.3.

Results

Cows in CON had follicle diameter of 14.10 ± 3.1 mm whereas CYS cows had follicle diameter of 35.73 ± 10.2 mm. Cows in CON and CYS did not differ (P=0.66) for serum concentrations of NEFA (0.615 and 0.728 ± 0.16 mmol/L), IL1B (14.27 and 15.79 ± 2.9 pg/mL), and glucose (51.14 and 51.42 ± 3.7 mg/dL), respectively. Cows in CON (0.308 ± 0.1 mmol/L) had lower (P=0.0001) follicular fluid concentration of NEFA when compared with CYS cows (0.889 ± 0.1 mmol/L). Cows in CON and CYS did not differ (P=0.17) for follicular fluid concentrations of glucose (55.77 and 44.13 ± 5.5 mg/dL). Cows in CON (10.88 ± 2.1 pg/mL) had a tendency (P=0.13) for lower follicular fluid concentration of IL1B when compared with CYS cows (15.82 ± 2.1 pg/mL).

Significance

In conclusion, cows with cystic ovaries had greater follicular fluid concentration of NEFA and tended to have higher concentration of IL1B. It seems that an inflammatory response may be involved in the follicular cyst etiology.