CONCENTRATION OF INSULIN-LIKE GROWTH FACTOR-I (IGF-I), LEPTIN, GROWTH HORMONE (GH), ESTRADIOL AND PROGESTERONE (P_4) IN FOLLICULAR CYSTS OF LACTATING DAIRY CATTLE

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It is believed that nutritional, physiological and pathological factors influence formation of follicular cysts in post-partum dairy cows. However, it is suspected that local factors within the follicular cyst environment have also a contribution. The role of GH, IGF-I in follicular cell function and induction of estradiol and LH receptors, respectively, as well as P_4 is reported for normal cows, but the peripheral or local role of these substances in follicular cysts remains unclear. Leptin appears to be the link between nutrition and reproduction, but is not documented in cows with follicular cysts (FC). The aims of the present study were to identify circulating and follicular protein concentrations of GH, IGF-I, estradiol, P_4 and leptin in a group of cows with follicular cysts (cases), compared to a group of normal cows (CTL). Twenty-eight postpartum (35–60 DIM) lactating Holstein cows were identified as having naturally occurring follicular cysts and were compared to equal number of controls under the same conditions. Ultrasound, palpation and P_4 concentrations were used to select cows with large follicles (>25 mm) persisting more than 7 days in absence of a CL, with low (<1.0 ng/mL) P_4 concentrations. Ultrasound-guided transvaginal follicular aspiration (Aloka SSD-500 with a ASU-66 curvilinear array) was performed to collect follicular fluid from cases and CTL. Blood samples were collected at aspiration for hormonal determination by radioimmunoassay. Data was analyzed using the SAS program (SAS Institute, Cary, NC, USA) for differences of least squares means and correlation analysis. Concentration of IGF-I was higher ($P = 0.001$) in FC as compared to FF of CTL (mean ± S.E.M.) (106.69 ± 6.34 ng/mL versus 79.74 ± 6.05 ng/mL, respectively); GH concentration was similar in FC and FF of CTL cows (1.76 ± 0.29 ng/mL versus 1.23 ± 0.20 ng/mL, respectively). Estradiol was lower ($P = 0.01$) in FC as compared to FF of CTL (326.96 ± 107.03 ng/mL versus 557.35 ± 85.47 ng/mL); while leptin FF concentration was similar between groups (FC versus CTL) (6.96 ± 0.7 ng/mL versus 6.72 ± 0.6 ng/mL, respectively). However, serum leptin was higher ($P = 0.0001$) in cases than CTL. Intrafollicular P_4 levels were higher ($P = 0.001$) in FC compared to CTL (5646 ± 2987.7 ng/mL versus 384.28 ± 81.9 ng/mL, respectively). However, when the volume of the cyst was controlled as a confounder, only a trend ($P = 0.19$) was determined. The significant differences between SER and FF compartments suggest independence between both. Higher follicular IGF-I concentration indicates active FC IGF-I production, which did not result ($r = 0.06$) in higher intrafollicular estradiol production, but was correlated ($r = 0.53$; $P = 0.05$) with P_4. This indicates an influence of IGF-I in production of P_4 in FC. Lower estradiol concentration may not be enough to induce and LH surge an ovulation in cystic cows playing a critical role in development of FC. Leptin and GH appear not to be involved in follicular cyst formation, as per the similar levels compared to normal cows and the lack of correlation with other follicular substances. It is possible that other intrafollicular factors, such as P_4, which is present in high amount in FF of cystic cows, may be involved in lowering estradiol production by affecting specific steroidogenic enzymes and proteases necessary for estradiol synthesis, providing the first step in follicular cyst formation.

Keywords: Cows; Ovulatory follicles; Serum; Follicular fluid; Follicular cysts

THE INFLUENCE OF STAGE OF SIMULATED ESTROUS CYCLE AND THE PRESENCE OF UROPATHOGENIC VIRULENCE FACTORS ON THE OCCURRENCE OF *E. COLI* INDUCED CYSTIC ENDOMETRIAL HYPERPLASIA/PYOMETRA COMPLEX IN THE BITCH

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Cystic endometrial hyperplasia/pyometra complex (CEH/P) can be induced in ovariectomised bitches during simulated diestrus by intra-uterine inoculation of *Escherichia coli* with five uropathogenic virulence factors (UVFs; Arora, et al. A model for cystic endometrial hyperplasia/pyometra in the bitch Theriogenology, in press). The aim of this study was to determine the influence of the presence of UVFs and the stage of