

Effects of Conjugated Linoleic Acid (CLA) on Hormones and Factors Involved in Murine Ovulation

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Abstract

Introduction: Ovulation is a physiologic process with an inflammatory response that depends on a coordinated activity of gonadotropins and steroid hormones, as well as inflammatory mediators such as cytokines, prostaglandins, leptin, nitric oxide (NO), etc. Conjugated linoleic acid (CLA) is composed of polyunsaturated fatty acids (PUFA) found in dairy products, beef and lamb. There is strong evidence that dietary CLA affects mediators involved in ovulation. The aim of this study was to determine the effects of different doses of dietary CLA on systemic and local hormones and factors involved in ovulation.

Materials and Methods: In this case-control study, 80 (50±2-day old) female mice were randomly divided into four groups (C as the controls and T1, T2 and T3 as the treatment groups). There were four replicates in each group and there were five mice in every replicate (20 mice, in total). The mice in the control group were fed with no CLA in their diet but the ones in the treatment group received 0.1, 0.3 and 0.5g/kg of CLA (replacing corn oil in the diet), respectively for 120 days. Later on, blood samples were obtained from the tails of animals that displayed estrus signs and estradiol (E₂), progesterone (P₄), LH, FSH, NO, leptin and TNF α were measured. Furthermore, the effects of CLA on the ovarian production of prostaglandins (PGs) and NO were investigated. The data were analyzed by SAS software.

Results: CLA significantly decreased serum levels of FSH ($p<0.05$), LH, estradiol, NO, leptin and TNF α ($p<0.01$). In addition, CLA decreased progesterone levels but this effect was statistically insignificant. The significantly negative effects of CLA were seen on the ovarian production of PGE₂ and PGF₂ α ($p<0.01$).

Conclusion: It seems that CLA may play an effective role in reducing the ovulation rate in mice as CLA adversely affected female reproduction and it had negative effects on systemic and local hormones involved in ovulation.

Key Words: Conjugated linoleic acid, Nitric oxide, Ovary, Ovulation, Prostaglandin, Gonadotropin.

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