

Oral eicosapentaenoic acid supplementation as possible therapy for endometriosis.

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Abstract

OBJECTIVE:

To investigate the anti-inflammatory effect of n-3 eicosapentaenoic acid (EPA) compared with n-6 linoleic acid (LA) in an endometriosis rat model. We focused on the relationship between lipid metabolism and inflammatory reactions in endometriosis based on the hypothesis that a lipid intake imbalance is one of the factors responsible for the recent increase of endometriosis.

DESIGN:

Prospective, randomized experimental study.

SETTING:

Animal surgery laboratory in a university hospital.

ANIMAL(S):

Sprague-Dawley rats (female, 6 weeks old).

INTERVENTION(S):

Rats were fed a diet with EPA (n = 9) or with LA (n = 9) for 2 weeks. Two weeks after feeding, the uterus was autotransplanted to the peritoneum to construct an endometriosis model. Feeding was continued for a total of 6 weeks. Two and 4 weeks after autotransplantation, three rats of each group were killed and evaluated.

MAIN OUTCOME MEASURE(S):

Endometriotic lesions were morphologically evaluated and their fatty acid composition was examined. Gene expression in these tissues was evaluated by cDNA microarray analysis and quantitative real-time reverse transcriptase-polymerase chain reaction (RT-PCR).

RESULT(S):

In the EPA group, the n-3:n-6 ratio in each tissue significantly increased and the thickening of the interstitium, an active site for inflammation in endometriosis, was significantly suppressed (0.30 +/- 0.09 mm [EPA group] vs. 0.77 +/- 0.23 mm [LA group]). The mRNA of metalloproteinases, interleukin-1beta, interleukin-1r, prostaglandin E synthase (Ptges), and nuclear factor (NF)-kappaB were reduced in the EPA group.

CONCLUSION(S):

EPA supplementation might be a valid strategy for the treatment of endometriosis.