

9th Yazd International Congress and Student Award on Reproductive Medicine with 4th Congress of Reproductive Genetics

Poster Presentations

P-55

Effect of dietary polyunsaturated fatty acids on the status of uterine prostaglandins during the window of pre-implantation

Rastgar Rezaei Y¹, Latifi Z², Nikanfar S², Nouri M³, Fattahi A⁴.

1. Department of Medical Biotechnology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

2. Department of Biochemistry and Clinical Laboratories, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran.

3. Department of Reproductive Biology, Faculty of Advanced Medical Sciences, Tabriz University of Medical Sciences, Tabriz, Iran.

4. Women's Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

Email: yeganerastgar@gmail.com

Background: The role of prostaglandins (PGs) in embryo implantation can be influenced by polyunsaturated fatty acids supplementation.

Objective: Therefore, the present study was conducted to investigate the effects of dietary omega-3 and -6 fatty acids on uterine PGs and their relevant receptors during the pre-implantation period in mice.

Materials and Methods: Twenty female mice were randomly divided into three groups and fed a standard pellet (control group), standard pellet +10% (w/w) fish

oil, and +10% (w/w) soybean oil. The uterine levels of PGI₂, PGD₂, and PGF₂ α , the mRNA expression of PG I, D, and F synthesis enzymes (PGIS, PGDS, and PGFS, respectively), and protein expression of their receptors (PI, PD, and PF, respectively) were evaluated in uterine tissues of all treated groups at days 1-5 of pregnancy.

Results: Our results showed that the uterine levels of PGI₂, PGD₂, and PGF₂ α and expression of their synthesis enzymes were markedly high on the 5th day of pregnancy, while protein expression showed significant elevation only for PF and PI during this day ($p < 0.05$). Omega-6 significantly raised uterine levels of all three PGs on the fifth day of pregnancy compared to mice received omega-3 ($p < 0.05$). Furthermore, the omega-6 group showed higher expression of PGDS and PGFS than the omega-3-supplemented group on days 5 and 4 of pregnancy, respectively. In addition, we found positive correlations between the implantation rate and expression levels of PGIS, PGFS, IP, and FP and the PGI₂ uterine levels.

Conclusion: Our study showed the positive effect of omega-6 PUFA supplementation on PGFS and PGDS expression together with the uterine levels of PGI₂, PGD₂, and PGF₂ α which makes PGs status as a possible indicator of successful implantation.

Key words: Embryo implantation, Pre-implantation window, Polyunsaturated fatty acids, Omega-3, Prostaglandins.