Serum selenium levels and glutathione peroxidases activity in infertile women due to idiopathic premature ovarian insufficiency in comparison to healthy fertile women: A case-control study

Abstract

Background: Increased oxidative stress in women with premature ovarian insufficiency have been well documented. In the view that glutathione peroxidase enzymes and their co-factor, selenium, play a protective role against apoptosis due to oxidative stress, the present study aimed to camper serum selenium levels and glutathione peroxidases activity in infertile women due to idiopathic premature ovarian insufficiency (iPOI) with fertile healthy women.

Methods: This case-control study was conducted at Al-Zahra Hospital, affiliated to Tabriz University of Medical Sciences, and the Academic Center for Education, Culture and Research (ACECR) Infertility Treatment Center between August 2017 and August 2018 in Tabriz, Iran. The iPOI group consisted of 32 infertile women with iPOI (with amenorrhea/oligomenorrhea at least for the last 4 months and FSH>40 mIU/ml) . The control group consisted of 31 age-and BMI-matched healthy fertile women. In the all participants, serum selenium levels were measured by an atomic absorption spectrophotometer, and plasma GPx activity was measured by a Glutathione Peroxidase Activity Assay Kit after about 12 hours of fasting.

Results: There was a significant lower serum selenium levels in the iPOI group compared to the control group (Adjusted Mean Difference (AMD) = -15.1 µg/ml, 95% CI: -24.8 to -5.3). The plasma GPx activity was lower in the iPOI group compared to the control group, although not significantly (AMD =-67.0 U/ml, 95%CI: -194.5 to 60.3). Both groups had similar selenium dietary intake and in accordance with the recommended dietary allowance (RDA) of 55 µg/day.

Conclusion: The present study showed low serum Se levels of women with iPOI and a negative correlation between Se and FSH. The important controversial issue is the possibility of a cause-and-effect relationship between Se concentrations and iPOI in these women. Epidemiological studies are warranted to clarify the issue. To evaluate the Se-dependent antioxidant defence capability, as measured by GPxs activity, in iPOI women more large-scale studies are required.

Keywords: Primary ovarian insufficiency, infertility, selenuim, glutathione peroxidase, antioxidant

Tabriz University of Medical Sciences

Nursing and Midwifery Faculty

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Title

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Supervisors:

Dr. Behnaz Sadeghzadeh Osquee

Dr. Kobra Hamdi

Advisers:

Dr. Azizeh Farshbaf-KHalili

Dr. Mojgan Mirghafourvand

Author:

Mehrangiz Delkhorrami

Date:

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