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The effect of health-promoting lifestyle education on the treatment of unexplained female infertility

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ABSTRACT

Objective: This study aimed to reveal the 1) awareness, 2) improvements of a health-promoting lifestyle on women with unexplained infertility having at least one of the risk factors that have been indicated to negatively affect fertility (smoking, body mass index lower than 18.5 kg/m^2 and more than 25 kg/m^2, over-exercising or not exercising at all, alcohol consumption, caffeine consumption of more than 300 mg/day, and high levels of stress) by means of health-promoting lifestyle education, 3) the effect of this improvement on the result of assisted-reproduction treatment in terms of clinical pregnancy.

Study design: 64 women diagnosed with unexplained infertility were divided into a group receiving Health-Promoting Lifestyle (HPL) education and a control group. 1) Risk Factors Questionnaire (BMI, Smoking, Alcohol, Stress, Exercise, Caffeine), 2) Depression, Anxiety and Stress Scale, 3) Health-Promoting Lifestyle Profile II. The health promoting lifestyle was given to the education group. The Risk Factors Questionnaire; Depression, Anxiety, Stress Scale and Healthcare-Promoting Lifestyle Profile II were also administered after the first-second-third month of education but before ART treatment.

Results: A statistically significant decrease was found in the average levels of four variables as; BMI ($p < 0.001$)-stress ($p < 0.001$)-caffeine consumption ($p < 0.001$)-lower exercise levels ($p < 0.001$). Moreover, the total number of risk factors that females had between the first and third interview decreased significantly. Clinical pregnancy rate after ART was 12 (46.15%) and 5 (19.24%) in education and control group consequently ($p = 0.02$).

Conclusion: Health-promoting lifestyle education was found to be effective in reducing the lifestyle risk factors for infertility and increasing the success rates of assisted reproduction treatment by correcting these risk factors.

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Introduction

Patients should always try to manage the lifestyle factors that can contribute to infertility, and the effectiveness of infertility treatment, despite technical developments in the treatment of infertility. The most frequently observed risk factors for infertility are smoking, body mass index (BMI) lower than 18.5 kg/m^2 and higher than 25 kg/m^2, over-exercising or not exercising at all, alcohol consumption, caffeine consumption of more than 300 mg/day, and stress. It seems that smoking negatively affects follicle development, ovulation and fertilization [1–5]. BMI > 25 kg/m^2 and BMI < 20 kg/m^2 were found to cause infertility in both females and males [6,7]. In addition, treatment of fertility was observed to be less successful in overweight and obese individuals [1,8–11]. Caffeine consumption of more than 300 mg/day is considered to be a risk factor in females in their reproductive years [1,5,11] and stress may affect the nervous and endocrine systems, and thereby fertility [5].

Additonally, information on reducing the negative effects of these factors on fertility by taking up a health-promoting lifestyle is gradually increasing [3,4,11]. Although evidence has been found of the positive effects of a health-promoting lifestyle on infertility, no randomised controlled studies were found in literature which analyzed the effect of these risk factors on the success of assisted-reproduction treatment in cases of unexplained infertility [1,3,4].

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This study aimed to reveal the 1) awareness, 2) improvements of a health-promoting lifestyle on women with unexplained infertility having at least one of the risk factors that have been indicated to negatively affect fertility (smoking, body mass index lower than 18.5 kg/m^2 and more than 25 kg/m^2, over-exercising or not exercising at all, alcohol consumption, caffeine consumption of more than 300 mg/day, and high levels of stress) by means of health-promoting lifestyle education, 3) the effect of this improvement onthe result of assisted-reproduction treatment in terms of clinical pregnancy.

Materials and method

Following the Local Ethics Committee approval, the study was conducted between July 1st 2014 and June 31st 2015 in the Reproductive Health Center of Eskişehir Osmangazi University's Faculty of Medicine. The Risk Factors Questionnaire and Depression, Anxiety and Stress Scale were completed by the women who were diagnosed with unexplained infertility and had at least two unsuccessful intra-uterine inseminations. Of 109 females; 13 could not be reached again, 17 did not agree to participate in the study, and 6 did not attend their scheduled interview despite agreeing to participate; therefore 73 females having at least one risk factor were included in the study. The file numbers of the females were divided into two groups, with file numbers ending with an odd number being assigned to the education group to ensure randomness. A power analysis was made to determine the number of participants for each groups. This analysis was based on the "ongoing pregnancy rate" in the study of Lledo et al., and the power analysis result obtained by comparing two independent rates in the Fischer-Exact Test showed that there should be at least 26 participants in both groups for a power of 80% to increase the pregnancy rate by more than 10% [12]. The education group and control group included 33 and 40 females respectively.

1) A Risk Factors Questionnaire 2) Depression, Anxiety and Stress Scale, 3) Health-Promoting Lifestyle Profile II were given to all study participants. The health promoting lifestyle education was given to the education group. The Risk Factors Questionnaire and Depression, Anxiety, Stress Scale were also administered after the first, second and third month of education and Health-Promoting Lifestyle Profile II was administered after the third month of education but before ART treatment.

Risk Factors Questionnaire

This questionnaire was prepared by the researchers in line with literature and included open and closed questions.

The participants' height and weight were measured and recorded to determine their BMIs. The BMI value was obtained by dividing the weight value (kilogram) by the height value (meters) [13]. A BMI of lower than 18.5 kg/m^2 and more than 25 kg/m^2 was accepted as a risk factor [1,6–10,14].

The following factors were accepted as risk factors: Daily smoking or passive smoking [1–5], consumption of one glass of alcohol or more per week [15,16], caffeine consumption of more than 300 mg daily [1,5,11], Not exercising at all, or doing heavy exercise for more than four hours per week [17] and stress [5].

The Depression, Anxiety and Stress Scale

The Depression, Anxiety and Stress Scale (DASS) developed by Lovibond and Lovibond in 1995 consists of 42 questions: 14 questions on depression, 14 questions on anxiety, and 14 questions on stress [18]. High scores on each of the depression, anxiety and stress subscales of this indicate that the individual has the said problem. Scores of 14 and above on the subscale were accepted as a stress risk factor [5].

Health-Promoting Lifestyle Profile II

The Health-Promoting Lifestyle Profile (HPLP) was developed by Walker et al. and originally had 48 questions [19]. Four questions were added later by Walker and Hill-Polerecky. The 52 questions measure the health-promoting behaviors of individuals [20]. There are six subscales: self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management. Each subscale can be used independently. The total score of the subscales is the total score of the HPLP. The lowest and highest scores of the scale are 52 and 216, respectively. Higher scores indicate that the individual shows the said health behaviors at a high level.

The education group was given Health-Promoting Lifestyle Education (HPLE) by the researcher (Y.K.) who is a specialist in infertility nursing and healthy lifestyle programmes. This education was prepared by the researchers in line with literature, and included information on the effects of the six behaviors most found to prevent pregnancy and successful IVF/ICSI and suggestions as to how to change these behaviors to a health-promoting lifestyle, based on the 2010 Cochrane Database [3,4]. Verbal narration, written and visual education materials were used during this education process. Within the scope of this education, face-to-face interviews were conducted in a separate room in the reproductive health center for approximately 15–20 min at a time. Afterwards, the content was gathered in a booklet and distributed to the participants to ensure continuity of the education. A telephone interview was conducted monthly over three months with each participant to provide support and to help them recognize the empowering results of positive health behaviors, to develop a positive point of view on the behaviors, and to improve self-monitoring. The barriers to these behaviors were discussed. At the end of each interview, objectives were determined to successfully continue the health-promoting behavior until the next interview.

After the third monthly follow-up, three females in the education group and six females in the control group were excluded from the study because they could not be reached again by telephone. Additionally, as a result of the evaluation before embryo transfer, IVF/ICSI procedures, four females in the education group and eight females in the control group were canceled due to problems with the embryos. In conclusion, embryo transfer was made for 26 females in both groups. The β HcG values and fetal heartbeats of all females were analyzed on the 15th day and 4th week, respectively (Fig. 1).

Statistical analysis

The continuous data were given as average ± standard deviation, and the categorical data were given as percentage (%). The Shapiro Wilk test was used to analyze the appropriateness of the data to normal distribution. The Kruskal–Wallis H test was used to compare three and more groups not appropriate to normal distribution. The Wilcoxon test was used to compare the values of two groups in different measurement times. Two-way repeated measures ANOVA (One Factor Repetition) was used for repeated measures. The direction and size of the correlation was determined using the Pearson correlation analysis for the variables showing a normal distribution and the Spearman correlation coefficient for the variables showing an abnormal distribution. The analysis of the cross tables were made using Pearson Chi-Square. The analyses were made using IBM SPSS Statistics 21.0. $p < 0.05$ was considered to be the threshold for statistical significance

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