ORIGINAL ARTICLE

Women Diagnosed with Endometriosis Possess High Body Mass Index Compared to Controls

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ABSTRACT

Aim: To measure and compare the body mass index (BMI) inwomen diagnosed with endometriosis with healthy females.
Design: Descriptive comparative study
Patients: Fifty women, age 20-40 years, diagnosed with endometriosis were included.
Methods: A total of 100 women were included in the study. The study population was divided into two groups endometriosis group (n=50) and control group (n=50). The women in endometriosis group were 20-40 years of age, recently diagnosed of endometriosis with history of infertility for more than one year. The control group (n=50) consists of same age group (20-40 years) and all women were screened negative of endometriosis and had history of proven fertility being mothered a child in previous two years. Females on any medication, co morbid conditions were excluded from the study. BMI was calculated by kg/m^2. The results are expressed as means±SD (kg/m^2).
Results: A significant increase in BMI (p=0.004*) was seen in cases (24.5±4.5) as compared to controls (22.8 ±3.02) kg/m^2. When women were categorized into stage of endometriosis; the difference was non-significant. However, the inter stage comparison of BMI revealed non-significant increasing trend with advancement of the stage.
Conclusion: High BMI in infertile endometriosis patients compared to controls substantiate the role of overweight in infertility. In such patients reduction in body weight is advisable to improve their fertility status.
Keywords: BMI, Endometriosis, Infertility

INTRODUCTION

Fertility is the ability of a couple to achieve pregnancies that survive to birth[1]. Infertility is theinability to become pregnant after one year of normal unprotected marital relations[2]. Approximately 15% of population in industrialized world is affected by infertility[3]. Endometriosis is common cause of infertility, this condition define as presence of ectopic endometrial tissue[4]. In Pakistan the disease frequency has been reported to be 16.8% in primary infertility cases[5]. This is in consistence with findings of other studies done on other populations[6,7].

Body mass index, or BMI, is an index of a person's relative "skinniness or heaviness". The BMI measured by weight in kilogram divided by height in meter square (kg/m^2). A high BMI indicates obesity. A standard medical definition of "normal" body weight is a BMI of about 18.5 - 24.9. A BMI under 18.5 indicates that the person is "underweight". A BMI of 25.0-29.9 indicates that the individual is "overweight"

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but not obese. A BMI over 30 indicates obesity. A BMI over 40 indicates extreme obesity[8].

A woman's weight can affect fertility. We know that at both extremes, very thin and obese, that there can be disruption of the normal process of regular, consistent ovulation. Anovulation can often result. Medications can be used to induce ovulation in these women in an attempt to become pregnant. Obesity is associated with increased risk for several serious disease processes. Extreme obesity is associated with a dramatically increased risk for many serious diseases[9].

Studies have shown high BMI associated with infertility whereas high BMI associated with low risk of endometriosis. Some authors have reported positive association of BMI and endometriosisand whereas others showed contradictions[10,11]..

The present study was conducted to compare the BMI of infertile females diagnosed with endometriosis and in healthy females.

MATERIAL AND METHODS

The study was approved by Ethical review board of University. Study population comprised of 50 diagnosed cases of endometriosis (with history of infertility of more than 1 year) of 20-40 years and 50

age matched normal fertile females (controls)having mothered a child in last two years and screened negative for endometriosis.Females on any medication or presenting co morbid conditions were excluded from the study**.** After takingwritten informed consent from all participants a detailed medical history with general physical and systemic examination was done by a qualified physician. Height was measured to the nearest 0.01 cm using a stadiometer. Body weight was measured to the nearest 0.05 kg on an electronic scale. BMI was calculated by putting values in formula i.e. weight (kg)/ height m^2.

Statistical analysis: Data were analyzed by using IBM-SPSS version 20.The variables were analyzed and described as Means (±SD). Two sample Student's't' test was applied to compare the BMI of both groups (cases and controls). A p value of ≤ 0.05 was considered as statistically significant. One way ANOVA was applied to compare the BMI among different stages of endometriosis.

RESULT

Mean BMI in cases was 24.5 (±4.5) and for controls 22.8 (±3.04)kg/m^2. A statistically significant difference (p=0.048) between cases and controls was observed (Table 1).

Table: 1. Comparison of means (±SD) values between cases and controls for BMI.

BMI (kg/m^2)	Cases (n=50)	Controls (n=50)	p value
Mean ±SD	24.5± 4.5	22.8± 3.04	0.048*

Based on the points system by American Society for Reproductive Medicine classification of endometriosis: 1996 and 1997, patients are assigned to one of the four stages.**Table 2** shows mean (±SD) BMI in all four stages of endometriosis. In order to analyze the inter-stage difference, one -way ANOVA was applied. Although the mean BMI values were higher at stage III and IV of endometriosis, the difference was not statistically significant (p=0.468*).*

Table 2: Comparison of BMI in all four stages of endometriosis.

BMI (kg/m^2)	Mean ±SD
Stage I (n=1)	23.4
Stage II (n=10)	22.5± 4.61
Stage III (n=21)	25.3± 5.22
Stage IV (n=18)	24.7± 3.59
p value	0.468

DISCUSSION

Endometriosis is a gynecological disease characterized by the existence of ectopic endometrial tissue. The increasing prevalence of obesity has had a profound impact on female reproductive health. Increased body mass index (BMI) is associated with ovulatory subfertility and anovulatory infertility. Overweight and obese women have poorer outcomes following fertility treatment.Weight loss regularizes menstrual cycles and increases the chance of spontaneous ovulation and conception in anovulatory overweight and obese women.Available data suggest that as little as 5%–10% weight loss can improve fertility outcomes[12]. Other studies have demonstrated that 5% weight loss results in improvement of endocrine parameters, such as decrease in free testosterone, lower fasting insulin levels and increased frequency of ovulation. The literature has consistently demonstrated an inverse relation between endometriosis and body weight (Missmer et al., 2004a, b; Parazzini et al., 2004)[13,14,15].

The aim of the present study was to compare BMI in age matched infertile females with diagnosed endometriosis as well as healthy females. Our results showed significantly higher (p=0.048) BMI in infertile endometriotic females compared to controls (Table 1). These results are in accordance with previous study which shows high BMI in infertile than normal fertile females.However these results are in contrary to previous study Shah et al., 2013, which showed inverse relation of BMI with endometriosis[16].

In order to establish a correlation between BMI and endometriosis, we further analyzed the mean BMI among different stages (I, II, III and IV) of endometriosis. The inter stage analysis revealed no significant difference in mean BMI between stages of endometriosis The discrepancy in results could be due to difference in sample size.

We also compared the demographic parameters *i.e.* age, age at menarche, height, weight but no statistical difference was observed among cases and controls.

Summarizing, our results favor the previous studies showing positive association of BMI with infertility.This is the first study in Pakistan which reports the BMI in infertile endometriotic females and its comparisons with normal females. A body of evidence exists supporting the fact that obesity is strongly related to infertility. Interestingly, in our study although the mean BMI was in normal range as reported internationally but was significantly higher than controls. This finding warrants further research

on the subject on a larger sample size of normal females to establish the cutoff values of BMI in Pakistan. Unfortunately, due to our financial limitations we could not expand our experiments which may give more detailed about BMI and its relation to infertility due to endometriosis.

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