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Sociodemographic anthropometric profile of infertile women with and without endometriosis

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Abstract
Objective: To compare sociodemographic and anthropometric profile of infertile women with and without endometriosis.
Design: cross sectional study of infertile patients undergoing laparoscopy as a diagnostic procedure.
Material and Method: 60 infertile women were included in study. Out of 60 infertile women, 30 had endometriosis and 30 were without endometriosis. Sociodemographic and anthropometric profile of both groups compared.
Result: Women diagnosed with endometriosis were taller, thinner, and had a significantly lower BMI (21.50 ± 2.73 kg/m^2 v/s 23.68 ± 1.76 kg/m^2).
Conclusion: Women diagnosed with endometriosis were found to have a lower BMI. Women with endometriosis may have a lean physique and it might be used as predictive factor in correlation with other factors for clinical diagnosis of endometriosis.

Keywords: anthropometric, infertile women, BMI, endometriosis

Introduction
Endometriosis is defined as the presence of endometrium like tissue (glands and/or stroma) outside the uterus. Endometriotic implants are most frequently found on the pelvic viscera and peritoneum but although rare it can also be found in the pericardium, pleura, lung and even the brain [1]. Endometriosis affects 10% to 15% of women of reproductive age [2]. The relationship between endometriosis and infertility is strong, as the monthly fecundity rate for a normal couple decreases from 15-20% to 2-5% when the women has endometriosis [3].
There are multiple risk factor and protective factors for endometriosis. Possible risk factors for endometriosis include early age at menarche, hypermenorrhoea, frequent menstrual cycle, nulliparity, mullerian anomalies, infertility, low birth weight, genetic as history of endometriosis in first degree relative, low birth weight, tall height, environmental factors like exposure of dioxin or polychlorinated biphenyls, fat rich diet and red meat. Multiparity, lactation, increased BMI and waist-hip ratio, vegetables and fruits rich diet are considered as protective factors for endometriosis [4].

Material and Methods
The hospital based comparative study was carried out in department of obstetrics & gynaecology of SMS Medical college, Jaipur from May 2019 to August 2020. Total 60 infertile women were included in this study, 30 infertile women with endometriosis (group-A) and 30 infertile women without endometriosis (group-B).

Inclusion Criteria
- Women with infertility duration ≥1 year.
- Women giving consent for participation in study.

Exclusion Criteria
- Women with a previous surgical diagnosis of endometriosis.
- Patient with active pelvic inflammatory disease diagnosed on basis of history and pelvic examination.
- Women who have husband with azoospermia or severe oligozoospermia (<10 million mobile spermatozoa per ml).
- Women who had taken hormonal medication (including combined oral contraception) within previous 3 months.
- Women with previous tubal ligation.
- Women with known contraindication to anaesthesia and surgical intervention like hysterolaparoscopy.

Methodology
After applying inclusion and exclusion criteria informed written consent was taken and women with infertility duration more than one year and willing to participate were recruited from Department of Obst and Gynae, SMS Medical College, Jaipur. Approval from institutional Research, Review Board and Ethical Committee was taken. Standardized data collection on a predesigned study proforma including a full infertility workup, after the initial visit was done. Sociodemographic profile of both groups compared. Anthropometric data collected as height, weight and BMI of both groups calculated and compared.

Results

Table 1: *Distribution of Subjects According to Age Group*

Age Group (in yrs)	Group-A		Group-B	
	No.	%	No.	%
20 - 25	8	26.67	12	40.00
26 - 30	18	60.00	11	36.67
31 - 35	4	13.33	7	23.33
Total	30	100.00	30	100.00

χ^2 = 3.30 p = 0.191

In our study maximum number i.e. 18 (60%) patients in Group-A were in age group 26-30 yrs followed by 8 (26.67%) in age group 20-25 yrs. In Group-B majority i.e. 12 (40.00%) patients were in age group 20-25 yrs.

Table 2: Distribution of Subjects According to Mean Age

Group	Group-A	Group-B	P-value
Mean Age (in yrs)	26.07 ± 3.20	25.50 ± 3.90	0.541

Mean age in Group–A was 26.07 ± 3.20 yrs and in Group-B was 25.50 ± 3.90 yrs.

Table 3: *Distribution of Subjects According to Religion*

Religion	Group-A		Group-B	
	No.	%	No.	%
Hindu	25	83.33	25	83.33
Muslim	5	16.67	5	16.67
Total	30	100.00	30	100.00

$\chi^2 = 0.00$ $p = 0.99$

In our study population maximum number of cases in both groups were Hindus (83.33%).

Table 4: *Distribution of Subjects According to Residence*

Residence	Group-A		Group-B	
	No.	%	No.	%
Rural	11	36.67	5	16.67
Urban	19	63.33	25	83.33
Total	30	100.00	30	100.00

$\chi^2 = 3.06$ $p = 0.143$

In Group-A, 19 (63.33%) belonged to urban area and 11 (36.67%) belonged to rural area. In Group-B, 25 (83.33%) belonged to urban area and 5 (16.67%) belonged to rural area.

Table 5: *Distribution of Subjects According to Education*

Education	Group-A		Group-B	
	No.	%	No.	%
Illiterate	7	23.33	12	40.00
Literate	23	76.67	18	60.00
Total	30	100.00	30	100.00

$\chi^2 = 16.23$ $p = 0.01$

In Group-A, 23(76.67%) women were literate and 7 (23.33%) were illiterate. In Group-B, 18 (60.00%) women were literate and 12 (40.00%) were illiterate.

Table 6: *Distribution of Subjects According to Socio-economic Status*

Socio-economic Status	Group-A		Group-B	
	No.	%	No.	%
Lower	6	20.00	14	46.67
Middle	23	76.67	16	53.33
Upper	1	3.33	0	0.00
Total	30	100.00	30	100.00

$\chi^2 = 5.45$ $p = 0.06$

Majority of women in both groups i.e. 76.67% in Group-A and 53.33% in Group-B belonged to middle class.

Table 7: *Distribution of Subjects According to BMI*

BMI (in kg/m^2)	Group-A		Group-B	
	No.	%	No.	%
<18	2	6.67	0	0.00
18 - 25	24	80.00	24	80.00
>25	4	13.33	6	20.00
Total	30	100.00	30	100.00
Mean ± SD	21.50 ± 2.73		23.68 ± 1.76	

$p = 0.005$

Mean BMI in Group-A was found to be lesser than Group-B (21.50 ± 2.73 kg/m^2 v/s 23.68 ± 1.76 kg/m^2).

Discussion

Compared with participants without endometriosis, affected women were older. Mean age in group with endometriosis was 26.07 ± 3.20 yrs and in group without endometriosis was 25.50 ± 3.90 yrs. The difference was not statistically significant. In our study population maximum number of cases in both groups were Hindus (83.33%). This may be due to the fact that Hindu community constitutes approximately 80.00% of the total Indian population, while the percentage of Muslims is 15.00%. This also demonstrates the demography of Rajasthan. Maximum patient's belonged to urban area, the reason would have been increased awareness and easy accessibility to health care services. In Group-A, 23(76.67%) women were literate and 7 (23.33%) were illiterate. In Group-B, 18 (60.00%) women were literate and 12 (40.00%) were illiterate. Majority of women in both groups i.e. 76.67% in Group-A and 53.33% in Group-B belonged to middle class. Mean BMI in Group-A was found to be lesser than Group-B (21.50 ± 2.73 kg/m^2 v/s 23.68 ± 1.76 kg/m^2). The difference of mean BMI was found to be statistically significant (p value 0.005). Moini A *et al* (2013) [5] found inverse correlation of BMI with endometriosis. In their study BMI was lesser in endometriosis group as compared to infertile women without endometriosis (24.14 ± 3.74 kg/m^2 v/s 26.21 ± 4.20 kg/m^2). Our study was also supported by study of Hediger ML *et al* (2005)[6] in which they observed that women diagnosed with endometriosis were found to have lower BMI (21.3 ± 0.6 kg/m^2) as compared to women without endometriosis (23.2 ± 0.4 kg/m^2). Missmer SA *et al* (2004) [7], Calhaz-Jorge C *et al* (2004) [8] also found inverse relationship of BMI with endometriosis. These studies indicate that women with low BMI are at more risk for development of endometriosis as compared to women with higher BMI. This could be explained by the fact that obese women have high estrogen level that leads to anovulatory and irregular menstrual cycle which causes reduction in frequency of menstrual episodes and retrograde bleeding.

Conclusion

Results of this study suggest that women with lower BMI are at increased risk of endometriosis. BMI is easily obtained parameter so it may be useful for prediction of risk of endometriosis. Further studies with large sample size are needed to clearly define the role of BMI in developing endometriosis.

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