



Evaluation of relationship between endometrial polyp and insulin resistance: A case control study

¹Dr. Sneha Amarnath, ²Dr. Supriya Patil, ³Dr. Ashish Kalburgi

¹II year resident, ²Professor, ³III year resident, Department of OBGY, Krishna Vishwa Vidhyapeeth, Karad, Maharashtra, India

Corresponding author: Dr. Supriya Patil, Professor, Department of OBGY, Krishna Vishwa Vidhyapeeth, Karad, Maharashtra, India

Abstract

Background: To evaluate relationship between endometrial polyp and insulin resistance.

Materials & methods: A total of 40 subjects were enrolled. The subjects were divided into two groups as 20 women with endometrial polyps (study group) and 20 in control group were included. The p-value less than 0.05 was considered significant.

Results: There was a significant difference between the groups in terms of BMI, insulin levels and HOMA-IR ($P < 0.05$). The MetS was present in 14 (70%) of women in the study group and in 3 (15%) in the control group ($P < 0.001$).

Conclusion: There might be a relationship between endometrial polyps, and insulin resistance.

Keywords: Endometrial polyp, Insulin, metabolic syndrome.

Introduction

Endometrial polyps are localized overgrowths of endometrial tissue that form finger-like projections from the surface of the endometrium. They consist of stroma, glands, and blood vessels and can be single or multiple.^{1,2} According to previous studies, the prevalence of endometrial polyps in women of all age groups ranges from 10 to 40%.³ Endometrial polyps may be asymptomatic, and the most common symptoms include excessive leukorrhea, abnormal uterine bleeding, and infertility.^{2,4} Most endometrial polyps are benign lesions, but approximately 3–5% of endometrial polyps have been reported as premalignant or malignant.⁵ However, the factors associated with premalignant and malignant changes in endometrial polyps are not completely understood. Endometrial polyps are localized hyperplastic overgrowths of endometrium that contain both endometrial glands and stroma. The large majority of these lesions are benign. Polyps have a variable presentation; they can occur as individual or multiple lesions, range in size from millimeters to centimeters, and can be sessile or pedunculated. Although endometrial polyps may be identified during evaluation of abnormal bleeding, many polyps are asymptomatic and only discovered during the infertility evaluation. Up to 25% of women with unexplained infertility have endometrial polyps on hysteroscopy.^{6,7} However, their effect on endometrial receptivity and fertility is unclear.

Generally, IR is a principal pathophysiological process that relates not only to diabetes but also to prediabetes, as well as preclinical hyperinsulinemia and dysglycemia of varied degrees. IR has been defined as the resistance of target organs to the actions of insulin so that increased concentrations of this hormone are necessary to obtain a normal biological effect.⁸ Accordingly, IR is the primary

cause of T2DM and occurs years before its clinical manifestation.⁹ This prediabetic state plays an important role in the development and progression of some types of cancers, including breast, prostate, colorectal, and endometrial neoplasia.¹⁰ There is accumulating evidence that the risk factors for IR are also risk factors for EC, which strongly suggests that the development of IR and EC may be parallelly promoted at the same time. A meta-analysis conducted by Saed et al. demonstrated that diabetes increases the risk of EC by 72%.¹¹ Hence, this study was conducted to evaluate relationship between endometrial polyp and insulin resistance.

Materials & methods

A total of 40 subjects were enrolled. The subjects were divided into two groups as 20 women with endometrial polyps (study group) and 20 in control group were included. The main parameters evaluated between the groups were age, BMI (body mass index), and homeostatic model assessment of insulin resistance (HOMA-IR). Complete investigation was done. Metabolic syndrome and insulin resistance were evaluated in both the groups. The collected data was analysed using SPSS software. The p-value less than 0.05 was considered significant.

Results

There was a significant difference between the groups in terms of BMI, insulin levels and HOMA-IR ($P < 0.05$). The MetS was present in 14 (70%) of women in the study group and in 3 (15%) in the control group ($P < 0.001$). Logistic regression demonstrated that MetS was a significant risk factor for endometrial polyps. The logistic regression model showed that the presence of MetS was an independent risk factor for endometrial polyp development.

Table 1: Demographic features

Parameters	Study group (n= 20)	Control group (n= 20)	P –value
Age	40.63	38.25	0.2
BMI (kg/m ²)	33.4	29.5	0.007*
Insulin (mU/L)	8.5	6.8	0.005*
HOMA- IR	2.1	1.6	0.000*

*: Significant

Table 2: Distribution of MetS and other parameters between groups

	Study group (n=20)	Control group (n= 20)	P -value
Metabolic syndrome	14 (70)	3 (15)	0.000*
Insulin resistance	8 (40)	2 (10)	0.001*

*: Significant

Table 3: Risk factors for endometrial polyps

Risk factors	P –value
Insulin	0.645
Metabolic syndrome	0.001*
Insulin resistance	0.425

*: Significant

Discussion

The pathogenesis and natural history of endometrial polyps are not very clear, exact cause of endometrial polyps is unknown, however, there are several theories proposed relating to the aetiology and pathogenesis of these lesions.¹² They are believed to be related to oestrogen stimulation, this may be as a result of an increased concentration of oestrogen receptors (ERs), predominantly ER-alpha in polyp glandular cells compared with normal endometrium, and a decreased expression of progesterone receptors (PRs) A and B in polyps compared with normal endometrium.¹³ Endometrial polyps contain both ERs and PRs, and the concentration of these receptors have been found to be much higher in the glandular epithelium in endometrial polyps in comparison with the normal epithelium.^{14,15} The concentration of ERs and PRs has been observed to have decreased in the stromal cells of endometrial polyps, which may prevent the stroma of the polyp from undergoing decidual changes and menstrual shedding which is seen in the rest of the endometrium.¹⁶ Hence, this study was conducted to evaluate relationship between endometrial polyp and insulin resistance.

In the present study, there was a significant difference between the groups in terms of BMI, insulin levels and HOMA-IR ($P < 0.05$). The MetS was present in 14 (70%) of women in the study group and in 3 (15%) in the control group ($P < 0.001$). A study by Ozkan NT et al, there was a significant difference between the groups in terms of BMI, WC, insulin levels and HOMA-IR ($P < 0.05$). The MetS was present in 32 (71.1%) of women in the study group and in 6 (13.3%) in the control group ($P < 0.001$). Logistic regression demonstrated that MetS was a significant risk factor for endometrial polyps. ROC curve analysis also showed that MetS was the most significant discriminative risk factor in the study group with an AUC of 0.789 (0.691-0.887; CI 95%). The study suggests that there may be a relationship between endometrial polyps, MetS and insulin resistance. Further studies are required to explain the role of this relationship in the pathogenesis of the disease.¹⁷

In the present study, logistic regression demonstrated that MetS was a significant risk factor for endometrial polyps. The logistic regression model showed that the presence of MetS was an independent risk factor for endometrial polyp development. Another study by Serhat E et al, the mean age of cases with endometrial polyps was significantly greater than the controls. The mean body mass index (BMI) of the cases with polyps was also significantly greater than the controls. There was no significant difference between groups with respect to prevalence of DM or HT. They suggest that obesity is an independent risk factor in the development of endometrial polyps. Clinicians should be aware in terms of endometrial polyps in the assessment of patients with $BMI \geq 30$. There was no relationship between HT or DM with presence of polyps.¹⁸ Endometrial polyps are mostly asymptomatic lesions, although they can present with abnormal uterine bleeding.¹⁹ Abnormal uterine bleeding is the most common symptom of endometrial polyps, occurring in approximately 68% of both pre- and postmenopausal women with the condition.²⁰ The bleeding may be due to stromal congestion within the polyp leading to venous stasis and apical necrosis.²¹ The abnormal uterine bleeding appears to increase with age: bleeding in premenopausal women is observed 6% less than in postmenopausal counterparts.²² This finding could also be as a result of selection bias as postmenopausal women are more likely to be investigated when presented with vaginal bleeding. Driesler et al. further noted that, contrary to what one might expect, the size of the polyp, number of polyps and anatomical location of the polyp(s) did not appear to correlate with bleeding symptoms.²²

Conclusion

There might be a relationship between endometrial polyps, and insulin resistance.

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