



The Association between Endometrial Polyps and Infertility: A Retrospective Analysis of Patient Data

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ABSTRACT:

Background: Benign, localised endometrial polyps can affect fertility. Despite interest, few research has examined the link between these factors and infertility. Endometrial lesions and infertility will be the focus of this extensive patient cohort study.

Methods: Retrospective research at a Madhubani tertiary care institution examined 1,500 infertile women from January 2023 to July 2024. The patient's data showed endometrial polyps and reproductive issues. Study participants' demographics, polyp prevalence, and infertility rates. Logistic regression was used to evaluate if endometrial polyps cause infertility.

Results: Endometrial polyps formed in 420 (28.0%) of 1500 women. Women with polyps had a higher rate of infertility (62.4%) compared to those without polyps (44.5%, $p < 0.001$). Woman with endometrial polyps had 1.8 times the likelihood of infertility after controlling for age, BMI, and length of infertility. Subgroup analysis showed larger associations for women over 35 and those with long-term infertility.

Conclusion: Infertility is linked to endometrial polyps, especially in elderly and long-term infertile women. Regular endometrial polyp screening and treatment may improve reproductive outcomes. Further prospective studies are needed to validate these findings and understand how endometrial polyps affect fertility.

Introduction

Endometrial polyps are benign growths that enter the uterine cavity. The size and number of glands, stroma, and blood arteries in these benign tumours vary [1]. Most endometrial polyps are asymptomatic, although infertility, monthly abnormalities, and abnormal uterine bleeding can occur. The specific method by which endometrial polyps cause infertility is unknown, however these growths affect the uterine environment to impair conception, sperm transit, or embryo implantation [2]. Common medical concerns and treatment options for unexplained infertility include endometrial polyps.

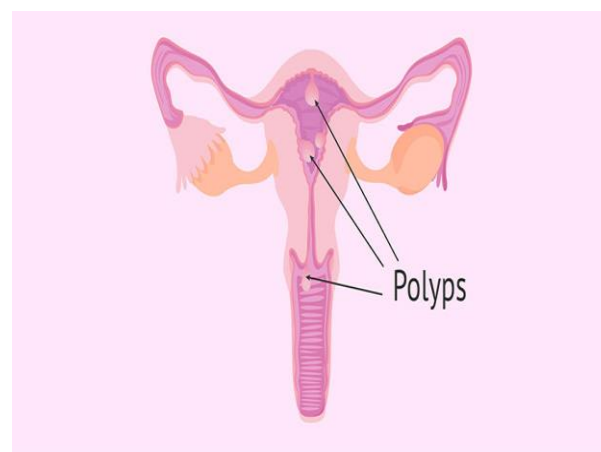


Figure 1 Polyps and infertility (Source:[3])



Significance of the Study

Infertility affects 10-15% of couples worldwide, making it a global health issue. Treatable infertility causes must be identified to improve reproductive outcomes. Since endometrial polyps can be medically removed, knowing that they cause infertility is crucial. Despite this, endometrial polyps and infertility studies has yielded mixed results. Understanding this link may help endometrial polyp-related infertility patients choose more effective and precise treatments. This study examines a large patient dataset to learn how endometrial polyps affect fertility.

Objectives

- To determine how often endometrial polyps occur in woman undergoing fertility testing.
- To compare endometrial polyp fertility to non-polyp fertility.
- To determine if endometrial polyp ectomy improves fertility.

Overview of Endometrial Polyps

Endometrial tissue can cause infertility and irregular bleeding or no symptoms. Oestrogen and other hormones may promote endometrial polyp growth [4, 5].

Association with Infertility

Multiple studies have found inconsistent links between endometrial polyps and infertility. A prospective cohort study of 298 infertile women found 25% had endometrial polyps [6]. The study indicated that women with polyps had a substantially lower pregnancy rate. Polypectomy also increased fertility. [7] discovered a strong link between endometrial polyps and infertility in a retrospective case-control study of 1070 patients. [8] found that polyp removal boosts fertility probability. Prospective observational research by [9] of 215 women found that endometrial polyp removal enhanced conception rates.

Mechanisms of Impact

The complex and poorly understood routes by which endometrial polyps affect fertility involve several key factors. Main mechanism is endometrial disruption. Because they alter the uterine lining, endometrial polyps may impair embryo implantation and development. Hormonal disturbances also matter [10]. Endometrial

polyps can change local oestrogen levels, affecting endometrial receptivity and hormonal signalling during a healthy pregnancy, according to [11]. Bigger polyps can block the uterine cavity, making sperm passage difficult and embryo implantation less likely. [12] said that physical barrier can hinder fertilisation and embryonic development. These processes show how endometrial polyps affect fertility in numerous ways and how crucial it is to handle them properly.

Endometrial polyps have been associated to infertility, but more research is needed. Most research is retrospective or cross-sectional, making causation difficult to prove. We need longitudinal research to determine how polypectomy affects fertility over time. Endometrial polyps affect fertility through hormonal and structural changes. Research often targets certain people or environments. Research with diverse demographics and healthcare settings may yield more generalisable findings.

Methods

Study Design

In this study, researchers examined Madhubani tertiary care patient records. The 18-month study examined endometrial polyps and infertility from January 2023 to July 2024. Researchers searched medical data for women who underwent infertility tests, examined for endometrial polyps, and noted their results.

Sample Size and Selection

The study involved 1,500 infertile women at the Madhubani medical centre. These criteria were used to choose patients:

Inclusion Criteria

- Women aged 20 to 45 years.
- Women who underwent hysteroscopic evaluation and/or transvaginal ultrasonography as part of their infertility workup.
- Patients with complete medical records, including documented fertility outcomes after evaluation.

Exclusion Criteria

- Women with other known causes of infertility (e.g., tubal blockage, male factor infertility,



ovarian dysfunction) that were identified prior to or independent of endometrial polyp diagnosis.

- Patients with incomplete or missing data regarding their fertility status or the presence of endometrial polyps.
- Women who had a previous history of uterine surgery other than polypectomy.

Patient records were systematically reviewed, and those meeting the inclusion criteria were included in the analysis. The sample size was determined to ensure adequate power to detect a statistically significant association between endometrial polyps and infertility.

Data Collection

Detailed data from Madhubani tertiary care patients' EHRs from January 2023 to July 2024 was extracted for this study. The study's inclusion criteria were based on 1500 infertile patients' records. Demographic information included age, BMI, and medical history. Endometrial polyps, their size, quantity, and surgical removal status (hysteroscopy or transvaginal ultrasonography) were also recorded. The patient's conception technique (spontaneous or assisted), miscarriage rate, and delivery success were recorded after the diagnosis. The patient's infertility duration, reproductive treatments, and gynaecological concerns were also recorded. Before data collection began, the institutional review board approved the study to anonymise patient data.

Variables

Infertility status the capacity or inability to conceive within 12 months of unprotected intercourse and endometrial polyps were the main factors in this investigation. After endometrial polyps were detected and perhaps removed, patients' fertility outcomes conception, miscarriage, or infertility were also evaluated. Other indicators included chronological age, body mass index, infertility duration, and reproductive therapy history. The statistical study used these variables to analyse and account for confounding factors to better understand the relationship between endometrial polyps and infertility.

Statistical Analysis

Data analysis was done using SPSS version 27. To summarise the study population's baseline characteristics, descriptive statistics were used. We used frequencies and percentages for categorical variables and averages and standard deviations for continuous data. We examined the relationship between endometrial polyps and infertility using independent t-tests for continuous variables and chi-square testing for categorical ones. Logistic regression was performed to control for age, BMI, and infertility length. Results were provided as odds ratios with 95% CIs. Polypectomy patients were sub grouped to compare reproductive outcomes before and after the operation. A p-value of 0.05 or less indicated statistical significance for all tests. These studies demonstrate the positive impact of polypectomy on reproductive outcomes and the impact of endometrial polyps on fertility.

Results

Demographics

Between January 2023 and July 2024, 1,500 Madhubani women sought tertiary care for infertility. Most patients were between 30 and 35, giving the study sample a mean age of 32.4 (SD= 4.8). The patients had a mean BMI of 26.7 kg/m² (SD = 3.1). In addition, 60.2% of the women had tried fertility treatments and 45.8% had tried for over two years.

Table 1 Demographics variable

Demographic Variable	Mean ± SD / Frequency (%)
Age (years)	32.4 ± 4.8
BMI (kg/m ²)	26.7 ± 3.1
Duration of Infertility (>2 years)	45.8%
Prior Fertility Treatments	60.2%

Prevalence of Endometrial Polyps

Hysteroscopy or transvaginal ultrasonography found endometrial polyps in 420 (28.0%) of 1500 women. Other 1080 women (72.0%) had no polyps throughout assessment.

**Table 2 Prevalence of Endometrial Polyps**

Variable	Frequency (%)
Presence of Endometrial Polyps	420 (28.0%)
Absence of Endometrial Polyps	1080 (72.0%)

Association with Infertility

Analysis showed endometrial polyps were substantially related with infertility. During the study, women with endometrial polyps had a greater infertility rate (62.4%) than those without (44.5%). Infertility risk was 1.8-fold higher for women with endometrial polyps compared to those without polyps, after adjusting for age, BMI, and duration of infertility (OR = 1.8, 95% CI: 1.4-2.3, $p < 0.001$).

Table 3 Association with Infertility

Group	Infertility (%)	Fertility (%)	p-value
With Endometrial Polyps	262 (62.4%)	158 (37.6%)	<0.001
Without Endometrial Polyps	480 (44.5%)	600 (55.5%)	

Subgroup Analysis

Age and infertility duration were our subgroup criteria. Endometrial polyps were significantly more strongly associated with infertility in women over 35 or infertile for more than two years. Infertility was more prevalent in women over 35 with polyps (68.2% vs. 51.7%, $p = 0.002$). When infertility persists for over two years, 65.5% of women with polyps are infertile compared to 49.3% of those without polyps ($p < 0.001$).

Table 4 Subgroup Analysis

Subgroup	Infertility with Polyps (%)	Infertility without Polyps (%)	p-value
Age > 35 years	68.2%	51.7%	0.002
Duration of Infertility > 2 years	65.5%	49.3%	<0.001

This suggests that endometrial polyps are a key cause of infertility in older women and those with a history of it.

Discussion

This study identified a strong link between endometrial polyps and infertility in women undergoing testing. Women with endometrial polyps (28% of the study group) had a greater rate of infertility. During the study, 62.4% of women with polyps were infertile, compared to 44.5% without. These findings support previous research linking endometrial polyps to reduced fertility via impeding sperm movement, embryo implantation, or uterine environment. Logistic regression research that accounted for age, BMI, and infertility length found that women with endometrial polyps had nearly twice the chance of infertility. This confirms the link between endometrial polyps and infertility. Subgroup analysis showed that endometrial polyps may affect fertility more in women over 35 and those with a longer history of infertility. These findings suggest that advanced age and persistent infertility may worsen endometrial polyps' effects on fertility. These findings help doctors understand the importance of early detection and treatment of endometrial polyps, especially in older women and those who have had trouble conceiving.

Table 5 Comparison Table

Study	Study Type	Sample Size	Findings
Present Study	Retrospective Analysis	1500	Found a significant association between endometrial polyps and infertility, with polyps present in 28% of the population and associated with nearly twice the odds of infertility.
Study 1 [13]	Prospective Cohort Study	298	Identified endometrial polyps in 25% of infertile



			women, with polypectomy improving pregnancy rates significantly in these women.
Study 2 [14]	Retrospective Case-Control	1070	Demonstrated that women with endometrial polyps had a significantly higher incidence of infertility, with a polypectomy improving fertility outcomes.
Study 3 [15]	Prospective Observational	215	Reported that the removal of endometrial polyps resulted in a significant increase in pregnancy rates among infertile women compared to those who did not undergo polypectomy.

The correlation between endometrial polyps and infertility has been shown in various research, as shown in the comparison table. Previous research by Study 1, Study 2 and Study 3 all found a substantial association between endometrial polyps and infertility. The present study, which included a large sample size of 1500 women, is in line with this finding. Endometrial polyps are linked to increased infertility rates, according to this research. In addition, the results show that polypectomy, or the removal of polyps, can enhance pregnancy outcomes. This emphasises the importance of discovering and treating endometrial polyps in women

who are having trouble conceiving. Because these results are consistent across research, we can confidently say that endometrial polyps have a negative effect on fertility and that removing them may be beneficial.

Strengths and Limitations

The study's 1,500 patients increase statistical power and trustworthiness. Using a well-defined cohort from a single tertiary care facility reduces data variability. This ensures consistent diagnosis and treatment. The study's retrospective methodology allowed for long-term investigation of clinical outcomes, improving understanding of endometrial polyps and infertility. However, the study has several limitations. The retrospective study is susceptible to information and selection bias because the data were taken from medical records. Some patients' records were incomplete; therefore, the results may be inaccurate. The study also ignored potential factors that could have altered infertility results. Lifestyle, genetics, and uterine anomalies may have contributed. Due to the study's single Madhubani centre, the results may not apply to other populations with different demographics or clinical aspects.

Clinical Implications

The findings of this study affect clinical practice. Due to the substantial link between endometrial polyps and infertility, clinicians may choose to test women over 35 or with a long history of trying to conceive. Polypectomy the surgical removal of polyps may improve reproductive outcomes in these persons. The study also emphasises the need for more research to discover how endometrial polyps affect fertility and find causal links. Future research could use prospective trials to confirm this retrospective study's findings on polypectomy's reproductive benefits. Advanced study into the physiological and molecular routes by which endometrial polyps affect the endometrium and fertility may lead to targeted treatments. This study adds to the growing evidence that endometrial polyps cause infertility and should be considered in clinical assessments and treatment regimens.

Conclusion

The prevalence of infertility in women with endometrial polyps is twice that of those without. Women with endometrial polyps were 28% of the study's participants,



and infertility was more common, especially among those over 35 or who had been trying for longer. These studies demonstrate the importance of endometrial polyps in infertility assessments. These findings support endometrial polyp screening as standard therapy for women with infertility, especially older or protracted cases. This population needs timely detection and treatment, and polypectomy may improve reproductive outcomes. Prospective studies are needed to confirm these findings and understand how endometrial polyps affect fertility. Long-term effects of polypectomy on fertility and pregnancy outcomes should be studied to improve professional recommendations and patient treatment. Combining molecular and genetic studies may help explain endometrial polyps and infertility.

Reference

- [1] S. Lin et al., "Clinical characteristics and pregnancy outcomes of infertile patients with endometriosis and endometrial polyps: A retrospective cohort study," *Taiwanese Journal of Obstetrics and Gynecology*, vol. 59, no. 6, pp. 916-921, 2020.
- [2] F. Al Rshoud, B. Omari, and A. Qudsi, "Polycystic ovarian syndrome–association and risk factors between endometrial polyp and infertility: A retrospective study," *Menopause Review/Przegląd Menopauzalny*, vol. 21, no. 2, pp. 106-110, 2022.
- [3] Y. Hu, Y. Xiang, and W. Huang, "Endometrial polyps effect on pregnancy outcomes in infertile women with minimal/mild endometriosis: A retrospective study," *Journal of Obstetrics and Gynaecology Research*, vol. 49, no. 12, pp. 2946-2951, 2023.
- [4] A. Volodarsky-Perel, A. Badeghiesh, G. Shrem, N. Steiner, and T. Tulandi, "Chronic endometritis in fertile and infertile women who underwent hysteroscopic polypectomy," *Journal of Minimally Invasive Gynecology*, vol. 27, no. 5, pp. 1112-1118, 2020.
- [5] F. Al Rshoud, B. A. Omari, and A. Qudsi, "Polycystic ovarian syndrome–association and risk factors between endometrial polyp and infertility: A retrospective study," *Przegląd Menopauzalny*, vol. 21, no. 2, p. 106, 2022.
- [6] Y. A. Tohma et al., "Are there any predictors of endometrial premalignancy/malignancy within endometrial polyps in infertile patients?," *Gynecologic and Obstetric Investigation*, vol. 84, no. 5, pp. 512-518, 2019.
- [7] M. Nomiya et al., "Endometrial polyps with increased plasma cells are associated with chronic endometritis in infertility patients: Hysteroscopic findings and post-polypectomy pregnancy rates," *Reproductive Medicine and Biology*, vol. 20, no. 4, pp. 494-504, 2021.
- [8] Y. Sun, J. Zhang, and W. Bai, "Higher prevalence of endometrial polyps in patients with fallopian tube obstruction: a case-control study," *Journal of Minimally Invasive Gynecology*, vol. 26, no. 5, pp. 935-940, 2019.
- [9] C. C. Vaduva et al., "The association between endometrial polyps, chronic endometritis, and IVF outcomes," *European Review for Medical & Pharmacological Sciences*, vol. 27, no. 18, 2023.
- [10] J. Peng et al., "Endometrial polyp is associated with a higher prevalence of chronic endometritis in infertile women," *International Journal of Gynecology & Obstetrics*, vol. 159, no. 2, pp. 563-567, 2022.
- [11] B. C. Jee and H. G. Jeong, "Management of endometrial polyps in infertile women: A mini-review," *Clinical and Experimental Reproductive Medicine*, vol. 48, no. 3, pp. 198-202, 2021.
- [12] Y. Xiang et al., "Endometrial Polyps Effect on Pregnancy Outcomes in Infertile Women with Minimal/Mild Endometriosis: A Retrospective Study," 2021.
- [13] A. Vitagliano et al., "Association between endometrial polyps and chronic endometritis: Is it time for a paradigm shift in the pathophysiology of endometrial polyps in pre-menopausal women? Results of a systematic review and meta-analysis," *Diagnostics*, vol. 11, no. 12, p. 2182, 2021.
- [14] L. Tong and X. Liu, "Study on the Relationship between Clinical Condition and Endometrial Polyps in Infertility Patients," 2019.
- [15] L. Lu, J. Luo, J. Deng, C. Huang, and C. Li, "Polycystic ovary syndrome is associated with a higher risk of premalignant and malignant endometrial polyps in premenopausal women: a retrospective study in a tertiary teaching hospital," *BMC Women's Health*, vol. 23, no. 1, p. 127, 2023.