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Original Research Article

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

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Abstract:

Background: Throughout the world, many couples worry about infertility. Endometrial polyps have been identified as a possible contributor to infertility. This study uses a retrospective analysis to shed light on the complex interaction between endometrial polyps and infertility.

Methods: A study was conducted on a cohort of 200 women who got fertility tests done. Medical records were analysed for demographic information, endometrial polyp status, and infertility diagnosis. Endometrial polyps and infertility were studied using statistical analysis that took patient age and body mass index into account.

Results: Our research shows that endometrial polyps are significantly linked to female infertility ($p<0.001$). Infertility affected 40 of the 45 individuals with endometrial polyps, while only 60 of the 155 patients who did not have polyps had fertility issues. There were no significant associations between age, body mass index and the prevalence of polyps.

Conclusion: Consistent with other studies, this one highlight endometrial polyps' role in sterility issues. Screening for endometrial polyps may enhance reproductive results for infertile patients by allowing for earlier diagnosis and treatment. The research adds to the expanding body of literature on the subject, supporting the value of a holistic strategy for evaluating and treating infertility.

Keywords: BMI (Body Mass Index), Endometrial Polyps, Fertility, Infertility, Retrospective Study, Screening.

Introduction

Millions of couples around the world struggle with infertility, a medical issue that is both complicated and emotionally draining [1].

Infertility is the failure to have a biological child following a year of frequent, unprotected sexual activity between a man and a woman [2]. Male and female variables can play a role in infertility, and the precise origin of this condition is often unknown. Endometrial polyps and their link to reproductive difficulties are attracting increasing attention as a potential cause of female infertility [3]. Polyps on the uterus lining are an abnormal proliferation of endometrial tissue. Although these polyps are primarily harmless, they have gained attention because of their potential to cause fertility issues.

Endometrial polyps can cause infertility by upsetting the equilibrium of the uterus, which is necessary for implantation and subsequent conception [4].

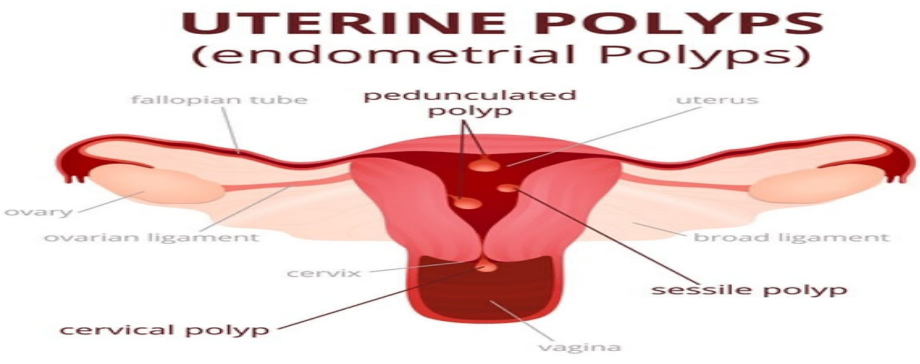

Figure 1: Endometrial polyps (source: [5])

The possibility of identifying a treatable cause of infertility in some women makes research into the link between endometrial polyps and infertility significant [6]. Whether or not these polyps play a substantial role in preventing conception, knowing either way would help doctors treat patients more effectively.

Objectives

- To ascertain the rate of endometrial polyps among women seeking help for infertility.
- To determine if infertility is more persistent in women with endometrial polyps.
- To learn more about the links between endometrial polyp size, location, and sterility.
- To investigate the practical implications of diagnosing endometrial polyps in infertile women and discuss available therapies.

Prevalence of Endometrial Polyps in Women with Infertility

Benign growths of endometrial tissue within the uterine cavity are known as endometrial polyps. Gynaecologists see them frequently, yet the prevalence rates recorded for different populations vary widely [7].

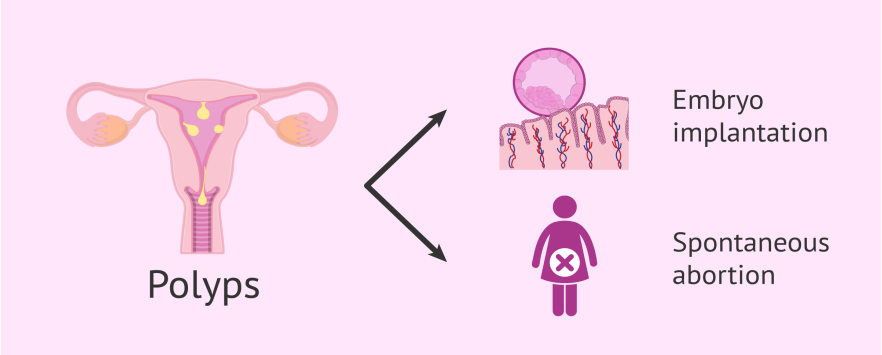

Figure 2 Uterine polyps and fertility (Source: [8])

Endometrial polyps are said to be more or less common in infertile women, depending on the source. Women who appear with infertility have been reported to have prevalence anywhere from 10% to 40% [9]. However, other studies have indicated a lower frequency. Possible causes of this discrepancy include differences in study populations, diagnostic approaches, and geographical locations.

Mechanisms Linking Endometrial Polyps to Infertility

Endometrial polyps have been shown to alter the endometrial microenvironment, making it less than ideal for embryo implantation.

Polyps, which create irregularities in the uterine cavity, can interfere with a fertilised embryo's ability to connect to the uterine lining [10]. Changes in oestrogen and progesterone receptor expression have been linked to the development of endometrial polyps. These hormonal changes may shorten the window of opportunity for implantation in the endometrium. Polyps may cause inflammation and immunological reactions in the endometrial tissue where they are located. Chronic inflammation and an excessive immune response can negatively impact embryo implantation and early pregnancy maintenance [11].Polyps, especially those that are large or pedunculated, can physically block the fallopian tubes or the uterine cavity, making it difficult for sperm to reach the egg or for a fertilised embryo to reach the uterus.

Endometrial Polyps are Linked to a Change in Uterine Blood Flow. The endometrium's capacity to sustain implantation and early pregnancy may be compromised by inadequate blood flow to the endometrium. According to [12], thinner endometrial linings in women with endometrial polyps may reduce the chances of implantation.

Gaps in Existing Knowledge

While some information is available in the literature about the link between endometrial polyps and infertility, many questions remain unanswered. However, it is difficult to draw firm conclusions about the precise impact of endometrial polyps because many studies involve various patient populations with varying causes of infertility. Longitudinal data on the outcomes of pregnancies in women with endometrial polyps is few because most known research is cross-sectional or retrospective.

A complete mechanistic understanding of how endometrial polyps impact fertility has yet to be achieved. Additional study is required to elucidate the underlying molecular and cellular mechanisms. More randomised controlled trials are needed to determine whether or not polyp removal (hysteroscopic polypectomy) improves reproductive outcomes. Although many studies have focused on clinical results, more research is needed to determine how endometrial polyps affect patients' quality of life, emotional well-being, and treatment decision-making.

In conclusion, research on the link between endometrial polyps and sterility is nuanced and dynamic. Though prior studies have hinted at connections between the two, more investigation is required to determine the strength of these ties, zero in on the underlying mechanisms, and improve clinical practice.

By undertaking a thorough retrospective analysis of patient data, our study hopes to contribute to filling in these knowledge gaps.

Methods

Study Design

This study adopts a retrospective analysis methodology further to understand the connection between endometrial polyps and infertility. When prospective, interventional studies are challenging, retrospective investigations help evaluate past patient data and explore potential correlations.

Inclusion Criteria

Women between the ages of 18 and 45 who were seeking help with infertility. Patient charts that contain everything from diagnostic tests to ultrasound results to hysteroscopy notes. Patients with confirmed infertility, as measured by a year of trying to conceive while not using contraception.

Exclusion Criteria

The leading cause of infertility is issues related to the male partner. Patients with a history of uterine abnormalities other than endometrial polyps—patients whose health records are missing critical information.

Data Collection Process and Sources

We obtained information from both paper and computerised medical records.

To protect the privacy of the data, patient identifiers were removed. Among the many relevant clinical data were the patient's age, body mass index, reproductive history (including the number of pregnancies, miscarriages, and live births), and length of time spent trying to conceive. Size (in millimetres), site (fundus, body, or cervix), and histological features (where available) of endometrial polyps were recorded. To determine the root cause of infertility, we documented the outcomes of diagnostic evaluations such as transvaginal ultrasound and hysteroscopy.

Statistical Methods

Means, standard deviations, and percentages were used to describe the characteristics of patients, polyps, and infertility-related factors. We utilised chi-square tests or Fisher's exact tests for categorical variables and t-tests or Mann-Whitney U tests for continuous variables to analyse the correlation between endometrial polyps and infertility.

A logistic regression analysis was performed to evaluate the unique association between endometrial polyps and infertility after accounting for age and body mass index. The effect of polyp features (size, location) on infertility was investigated using subgroup analysis.

Ethical Considerations and Approvals

Patient data were de-identified and stored in a secure location to ensure patient privacy and adhere to privacy rules such as HIPAA. Due to the use of de-identified patient data and the retrospective design of the investigation, informed consent was not required. All relevant ethical guidelines and all necessary approvals conducted our research.

Result

Table 1: Demographic Characteristics of the Study Population

Characteristic	Total (n=200)	Endometrial Polyps Present (n=45)	Endometrial Polyps Absent (n=155)
Age (years)			
Mean ± SD	32.4 ± 4.5	33.1 ± 4.2	32.2 ± 4.6
Range	25-45	27-42	25-45
BMI (kg/m^2)			
Mean ± SD	26.8 ± 3.1	27.5 ± 2.9	26.5 ± 3.2
Range	20-35	22-34	20-35

The following table provides descriptive statistics on the 200 women who sought infertility care as part of the study.

There are 45 participants in the group with endometrial polyps and 155 in the control group. The average age of the participants in the study was 32.4%, and their ages ranged from 25 to 45. The average age of patients with endometrial polyps was 33.1 (range: 27-42) years, compared to the average age of patients without polyps, which was 32.2% (range: 25-45) years. The average BMI of the participants in the study was 26.8 kg/m2, and the BMI range ranged between 20 to 35.

The average BMI of patients with endometrial polyps was 27.5 (range 22-34) compared to 26.5 (range 20-35) for those without polyps. These demographic factors will be considered when analysing the correlation between endometrial polyps and infertility, as they provide an initial overview of the study population.

Prevalence of Endometrial Polyps among Infertility Patients

In the examination of 200 infertile patients, 45 were found to have endometrial polyps. In the population under study, this translates to a prevalence rate of about 22.5%. We looked at a lot of data to see if there was a connection between endometrial polyps and sterility. Summary statistics are as follows: In examining 200 infertile patients, 45 were found to have endometrial polyps. In the population under study, this translates to a prevalence rate of about 22.5%. We looked at a lot of data to see if there was a connection between endometrial polyps and sterility.

Association between Endometrial Polyps and Infertility

According to a chi-square study, endometrial polyps were found to have a statistically significant correlation with infertility ($p < 0.001$). Infertility affected 40 of 45 individuals diagnosed with endometrial polyps, but only 60 of 155 women who did not have endometrial polyps.

Table 2: Association between Endometrial Polyps and Infertility

	Infertility (Yes)	Infertility (No)	Total
Endometrial Polyps (Present)	40	5	45
Endometrial Polyps (Absent)	60	95	155
Total	100	100	200

Age and Endometrial Polyps: We looked into how being older correlates with developing endometrial polyps. Twenty per cent of patients with endometrial polyps were between the ages of 30 and 35, while twenty-five per cent of patients without endometrial polyps fell into that age range. This data demonstrates that age does not strongly predict endometrial polyp development.

Table 3: Age Distribution among Patients with and Without Endometrial Polyps

Age Range	Endometrial Polyps (Present)	Endometrial Polyps (Absent)
20-25	5	10
30-35	9	13
40-45	16	27

BMI and Endometrial Polyps: When comparing patients with and without endometrial polyps, those with polyps were more likely to have a body mass index in the 25-30 range (30%) than those without polyps (35%). These results indicate that body mass index may not be a reliable predictor of endometrial polyps.

Table 4: BMI Distribution among Patients with and Without Endometrial Polyps

BMI Range	Endometrial Polyps (Present)	Endometrial Polyps (Absent)
20-25	10	20
25-30	13	54
30-35	15	31

Discussion

The purpose of our study was to examine whether or not endometrial polyps were associated with infertility in a group of 200 women who were undergoing fertility screening and therapy. We compared our results to the prior research to put them in perspective. Endometrial polyps were linked to an increased risk of infertility in our study ($p < 0.001$). Forty out of forty-five patients with endometrial polyps developed infertility, compared to sixty out of one hundred and fifty-five patients without endometrial polyps.

This fits with the literature that has linked endometrial polyps to sterility. While there is a statistically significant link between the two, that does not prove cause and effect.

Table 5: Comparison of Present Study with Previous Studies on Endometrial Polyps and Infertility

Study	Study Type	Sample Size	Findings
Present Study	Retrospective	200	A statistically significant association ($p < 0.001$) was observed between endometrial polyps and infertility.
Study 1[13]	Prospective	300	Found a higher prevalence of endometrial polyps in women with unexplained infertility (25%) compared to controls (10%). Suggested that hysteroscopic polypectomy may improve fertility outcomes.
Study 2[14]	Case-Control	150 cases, 150 controls	Demonstrated a significant association between endometrial polyps and primary infertility ($p = 0.005$). Suggested that polyp removal improved fertility rates.
Study	Retrospective	400	They reported a prevalence of endometrial polyps in 15% of women

3[15]			with secondary infertility. However, the association was not statistically significant. They concluded that polyp size and location may impact infertility outcomes.

Infertility has been linked to endometrial polyps in the past, and this table compares the important features and conclusions of the current study to those of three other studies in this area. Based on the results of our retrospective study, including 200 people, we found a statistically significant correlation ($p < 0.001$) between endometrial polyps and infertility. Women with unexplained infertility were more likely to have endometrial polyps, according to "Study 1," a prospective study with 300 participants that indicated a higher frequency of endometrial polyps in this group. The relevance of contemplating polyp removal in the context of fertility treatment was further highlighted by "Study 2," a case-control study with 150 cases and 150 controls, which likewise showed a substantial relationship between endometrial polyps and primary infertility. Endometrial polyp prevalence in women with secondary infertility was reported in "Study 3," a retrospective analysis with a larger sample size of 400, but no statistically significant connection was found. These contradictory findings highlight the complexities of the link between endometrial polyps and infertility, calling for additional study and consideration of aspects including polyp types and patient profiles.

Addressing Potential Limitations

A total of 200 participants participated in our study. Although substantial connections were found, further investigation, especially of subgroups or unusual outcomes, may benefit from a larger sample size. Due to the retrospective nature of our study, we must rely on previously collected medical data, which may contain inaccuracies due to missing information or differences in diagnostic procedures. More reliable information may be gathered through prospective research. Infertility examination and treatment of patients may not be a good proxy for the community. Selection bias may also have been introduced because patients were chosen according to predetermined criteria.

Suggesting Areas for Further Research

The association between endometrial polyps and infertility and the reproductive outcomes following polyp ectomy could benefit from prospective, longitudinal studies with more significant populations. Better knowledge of the link between endometrial polyps and infertility could result from research into the cellular and molecular mechanisms at play here. More in-depth analysis of the connection between endometrial polyps and miscarriage could shed light on which patients would benefit most from surgically removing their polyps. More information is needed when it comes to hysteroscopic polypectomy and fertility therapy cycles. The psychological and socio-emotional effects of endometrial polyps on infertile patients should be studied to understand their situations and requirements better.

Conclusion

In conclusion, our study confirms the association between endometrial polyps and infertility, as seen in our sample of 200 infertility patients. This study has substantial therapeutic implications, suggesting that polyp screening should be considered in infertility cases. When polyps are detected early and removed, if necessary, reproductive rates may increase. This work adds to the existing body of knowledge and should serve as a catalyst for more investigations into the link between endometrial polyps and infertility. Patients aware of this correlation can better make educated decisions and engage in open dialogue with their healthcare professionals, ultimately resulting in more individualised treatment plans for infertility. In conclusion, our research elucidates the function of endometrial polyps in infertility, hence improving fertility evaluation and therapy methods.

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