**Original Investigation** | Özgün Araştırma

GMJ 2024;35:387-392

**DOI:** http://dx.doi.org/10.12996/gmj.2024.4128

# The Effect of Hysteroscopy on Fertility in Women with Unexplained Infertility

## Açıklanamayan İnfertilitesi Olan Kadınlarda Histeroskopinin Fertilite Üzerine Etkisi

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## ABSTRACT

**Objective:** This study aimed to investigate how undergoing hysteroscopy affects the reproductive rates of women with unexplained infertility.

**Methods:** A total of 145 women who were aged between 20 and 40 years, who had been diagnosed with unexplained infertility and who underwent hysteroscopy at the study center between 1 January 2021 and 1 January 2022 were enrolled in this study. All patients who underwent hysteroscopy were put to an 18-month-long follow-up period.

**Results:** The clinical pregnancy rate was 43.4%, whereas the live birth rate was 38.6% in this cohort. Average time to pregnancy took 5.6±1.8 months (range: 2-9 months). The mode of conception was unassisted in 28 pregnancies (44.4%) whereas the mode of conception was ovarian stimulation combined with intrauterine insemination in 23 pregnancies (36.5%) and in vitro fertilization in 12 pregnancies (19.1%). The patients who were able to conceive after hysteroscopy had significantly younger age, lower gravidity, and parity than those who failed to conceive (p=0.008, p=0.005 and p=0.001, respectively). The patients who successfully gave birth to living newborns after hysteroscopy had significantly younger age, lower gravidity, and parity than those who failed to deliver (p=0.040, p=0.003 and p=0.001, respectively). Septum resection was significantly more frequent and adhesiolysis was significantly less frequent in patients who were able to give birth to living newborns after hysteroscopy (p=0.038 and p=0.014, respectively).

**Conclusion:** Hysteroscopy appears to have a positive impact on live birth rates in women with unexplained infertility.

**Keywords:** Dysfunctional uterine bleeding, hysteroscopy, infertility, pregnancy

## ÖZ

**Amaç:** Bu çalışmada açıklanamayan infertilitesi olan kadınlarda histeroskopi yapılmasının üreme oranlarını nasıl etkilediğinin araştırılması amaçlanmıştır.

**Yöntemler:** Çalışmaya 1 Ocak 2021 ile 1 Ocak 2022 tarihleri arasında, çalışma merkezinde açıklanamayan infertilite tanısı almış ve histeroskopi uygulanmış 20-40 yaş aralığındaki toplam 145 kadın dahil edildi. Histeroskopi uygulanan tüm hastalar 18 aylık takip edildi.

**Bulgular:** Bu kohorttaki klinik gebelik oranı %43,4 iken canlı doğum oranı %38,6 idi. Gebeliğe kadar geçen süre ortalama 5,6±1,8 ay idi (aralığı: 2-9 ay). Gebeliklerin 28'i (%44,4) spontan iken, 23 gebelik (%36,5) over stimülasyonu ve intrauterin inseminasyon kombinasyonuyla ve 12 gebelik (%19,1) ise in vitro fertilizasyon ile oluşmuştur. Histeroskopi sonrası gebe kalabilen hastaların yaşı, gebe kalamayanlara göre anlamlı derecede daha gençti, gebelik ve pariteleri daha düşüktü (sırasıyla; p=0,008, p=0,005 ve p=0,001). Histeroskopi sonrası canlı doğum yapabilen hastaların yaşları, doğum yapamayanlara göre anlamlı derecede daha genç, gebelik sayıları ve pariteleri daha düşüktü (sırasıyla; p=0,040, p=0,003 ve p=0,001). Histeroskopi sonrası canlı doğum yapabilen hastalarda septum rezeksiyonu anlamlı derecede daha sık, adezyolizis ise anlamlı derecede daha az sıklıkta görüldü (sırasıyla; p=0,038 ve p=0,014).

**Sonuç:** Histeroskopinin, açıklanamayan infertilitesi olan kadınlarda canlı doğum oranları üzerinde olumlu bir etkisi olduğu görülmektedir.

**Anahtar Sözcükler:** Disfonksiyonel uterin kanama, gebelik, histereskopi, infertilite

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**Received/Geliş Tarihi:** 01.02.2024
**Accepted/Kabul Tarihi:** 13.03.2024

## INTRODUCTION

Infertility has been described as the inability to conceive after 12 months of regular unprotected sexual intercourse (1). There is an identifiable cause of infertility in about 85% of the affected couples. Ovulatory disorders, male factor, and tubal-uterine involvement account for the identifiable causes of infertility (2). For the remaining 15% of the couples, unexplained infertility is diagnosed in the absence of any identifiable cause (3).

The treatment of unexplained infertility is based on increasing the chance of conception per cycle (4). The first choice is ovarian stimulation, which increases the number of available oocytes and thus enhances the conception rate. To provide a more precise timing of conception, ovarian stimulation can be combined with intrauterine insemination (IUI). Lastly, in vitro fertilization (IVF) can be performed to allow the fusion of oocytes and sperms (4,5).

It has been emphasized that the term "unexplained infertility" shrinks as the causes related with infertility become identified (3). For instance, endometrial receptivity, oxidative stress, and genetic factors might participate in the pathogenesis of infertility for the couples who have no identifiable cause despite undergoing routine infertility workup (6-8).

Hysteroscopy is an endoscopic procedure that has become the gold standard for the assessment of the cervical canal and uterine cavity (9). It has been reported that carrying out hysteroscopy before assisted reproduction treatment contributes to the success of this treatment (10). That is, hysteroscopy can improve reproductive outcomes by eliminating intrauterine pathologies and regulating implantation (11). Since couples with unexplained infertility should be offered a safe and cost-effective approach based on prognostic evaluation, it is prudent to include hysteroscopy in their work-up (12). However, routine use of hysteroscopy is not recommended in case of unexplained infertility (13).

The present study aimed to investigate how undergoing hysteroscopy affects the reproductive rates of women with unexplained infertility.

## MATERIALS AND METHODS

This prospective cohort study was approved by the Ethics Committee of Afyonkarahisar Health Sciences University where it was undertaken (approval number: 2023/12/497, date: 01.12.2023). Each participant was informed about the study, and written informed consent was obtained from all participants.

A total of 145 women with unexplained infertility who underwent hysteroscopy at the study center between 1 January 2021 and 1 January 2022 were enrolled into this study. The inclusion criteria were being aged between 20 and 40 years and diagnosed with unexplained infertility. The diagnosis of unexplained infertility was made after known factors for infertility. were ruled out. Ovulation was verified with follicular monitoring by transvaginal ultrasonography and serial measurements of serum estradiol and/or mid-luteal progesterone ≥5 ng/mL within regular and uninduced menstrual cycles. Tubal patency was demonstrated by hysterosalpingography and/or pelvic laparoscopy. Male factors were designated according to the spermiogram parameters declared by the World Health Organization (14).

Women aged younger than 20 years and older than 40 years, the women with known cause of infertility such as ovulatory dysfunction and tubal obstruction, women who had partners with male factors, women who were diagnosed with endometrial hyperplasia or cancer after hysteroscopy, and women who abandoned the idea of conceiving were excluded.

All participants had pelvic examination and transvaginal ultrasonography with 7.5 MHz probe (Voluson E8, GE Healthcare, Chicago, IL, USA). Body mass index (BMI) was calculated by dividing body weight (kg) by the square of height ($m^2$).

### *Hysteroscopy Procedures*

All hysteroscopy procedures were conducted between the 7$^{th}$ and 11$^{th}$ days of the menstrual cycle. Paracervical block was provided by 10 mL of 1% lidocaine in every procedure. A rigid 4 mm continuous flow BETTOCCHI® hysteroscope with 30° direction of view was inserted into the uterus through the cervical canal and uterine cavity was expanded by irrigation with 0.9% saline solution (Karl Storz Endoscopy, Utrecht, Netherlands). After introducing the hysteroscope via the internal cervical ostium, the uterine cavity was visualized carefully.

Whenever intrauterine pathology was detected, general anesthesia was administered, and operative hysteroscopy was performed. Before operative hysteroscopy, cervical dilatation up to 10 mm was achieved by using Hegar dilators. The intrauterine pressure was standardized to 150 mmHg during surgery by continuous infusion of 5% glucose solution through an automated pump. Monopolar instruments were used to remove the polyps, while an electroresectoscope was adopted to correct the uterine septum. After the resectoscope was positioned to confirm the location, size, and range of the septum, needle electrode was activated to cut the septum, and abdominal ultrasonography was used to monitor the safety of the surgery. Isthmocele repair was performed by a resectoscope with bipolar electrode loop (26 Fr., 4 mm, 0°). On the other hand, adhesiolysis was conducted using cold scissors with an irrigation/suction device. Hysteroscopy-related complications occurred in none of these patients.

All patients who underwent hysteroscopy were put to an 18-month-long follow up period after the procedure. Data related with demographic characteristics, infertility type and duration, hysteroscopy indications, operative procedures, histopathological findings, and reproductive and perinatal outcomes were acquired from medical records. Clinical pregnancy was defined in case fetal heartbeat was detected by ultrasonography.

### *Ovulation Induction and Intrauterine Insemination*

Ovulation induction was carried out by administering clomiphene citrate, letrozole or recombinant follicle stimulating hormone (FSH). Clomiphene citrate was begun on 3$^{rd}$ day of the menstrual cycle and given at a dose of 50-150 mg/day for five days. Letrozole was started at a dose of 2.5-5 mg/day on 3$^{rd}$ day of the menstrual cycle and continued for 5 days. Recombinant FSH was administered according to the low-dose step-up protocol, beginning with doses of 37.5 to 75 IU/day. When transvaginal ultrasonography visualized that follicle size reached ≥18 mm, recombinant human chorionic gonadotropin

(HCG) was applied at a dose of 250 µg intramuscularly. It was made sure that there was only one dominant follicle at the day of HCG trigger. The following HCG trigger, IUI was performed after 24 or 36 hours. Semen samples for IUI were collected via masturbation and prepared with swim up method. After IUI was conducted by an elastic cannula, luteal phase support was provided by prescribing progesterone capsules of 200 mg vaginally. Luteal phase support was maintained by progesterone until 13th day of IUI when serum beta HCG levels were measured.

### *In Vitro Fertilization*

A short-stimulation protocol was adopted, starting with the subcutaneous injection of gonadotropin releasing hormone agonist. Then, ovarian stimulation was provided with the administration of recombinant FSH, starting either on day 4 at 150 IU when the women were ≤37 years old or on day 2 with 225 or 300 IU if the women were older than 38 years. This dose was adjusted by transvaginal ultrasonography findings and serum estradiol concentrations during ovarian stimulation. When the desired follicle growth was achieved, HCG was injected at a dose of 10000 IU subcutaneously, followed by oocyte pickup 36 hours later.

Freshly ejaculated semen was liquefied and diluted 1:1 with N-2-hydroxyethylpiperazine-N'-2-ethanesulfonic acid (HEPES)-buffered Earle's medium supplemented with 0.5% human serum albumin. The diluted sample was pipetted on top of a 1 mL layer of 70% Percoll or a 1-mL layer of 70% PureSperm in a 12 mL tube and was processed by centrifuge (800 x g, 10 minutes). The supernatant was removed, and the sperm pellet (0.1-0.5 mL) was resuspended in 5 mL of HEPES-buffered Earle's medium. This suspension was washed twice, first in HEPES-buffered medium and a second time in universal IVF medium. The spermatozoa were kept at 37° C in a $CO_2$ incubator until IVF was achieved.

The retrieved oocyte-cumulus complexes (OCCs) were pooled and washed in HEPES-buffered Earle's medium and then randomly transferred into groups of two to six OCCs to droplets of 25 µL of universal IVF medium under mineral oil and then put into an incubator (37 °C, 5% $CO_2$).

The OCCs were then cultured individually in 25 µL droplets of universal IVF medium. Each oocyte was inseminated with 75000-150000 motile spermatozoa, 2-6 hours after oocyte retrieval. Fertilization was scored 16-18 hours after insemination. The surrounding cumulus cells were removed mechanically by repeated pipetting of the OCCs, and the oocytes were transferred to new 25 µL droplets of universal IVF medium. Embryo transfer occurred 3 days after oocyte retrieval. Transfer of one or two embryos was based on the regulations of the Turkish Ministry of Health. Women younger than 35 years of age and who were undergoing their first or second embryo transfer could only have a single embryo transfer. A maximum of two embryos could be transferred to women older than 35 years or who were undergoing second embryo transfer. Luteal phase support was maintained by progesterone until 13th day of embryo transfer when serum beta HCG levels were measured.

### *Statistical Analysis*

The data collected were analyzed using the Statistical Package for Social Sciences version 22.0 (SPSS IBM, Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were denoted as numbers or percentages, where appropriate. Student's t-test and the chi-square test were used for comparisons. Two-tailed p values <0.05 were accepted as statistically significant.

## RESULTS

Sixty-three clinical pregnancies were conceived by 145 women with unexplained infertility, and 56 pregnancies resulted in live births during the follow-up period. The clinical pregnancy rate was 43.4%, whereas the live birth rate was 38.6% in this cohort. Average time to pregnancy took 5.6±1.8 months (range: 2-9 months). The mode of conception was unassisted in 28 pregnancies (44.4%) whereas ovarian stimulation combined with IUI was performed to conceive 23 pregnancies (36.5%) and IVF was used to conceive 12 pregnancies (19.1%). Five miscarriages (7.9%), 1 ectopic pregnancy (1.6%) and 1 intrauterine demise (1.6%) occurred in this study cohort while there were 4 twin pregnancies (6.3%).

Table 1 presents the demographic and clinical characteristics of patients with unexplained infertility with respect to clinical pregnancy. The patients who were able to conceive after hysteroscopy had significantly younger age, lower gravidity, and parity than the patients who failed to conceive after hysteroscopy (p=0.008, p=0.005 and p=0.001 respectively). The patients who were able to conceive and the patients who failed to conceive were statistically similar with respect to BMI, duration, and type of infertility, and hysteroscopy indication (p>0.05 for all). In addition, the patients who succeeded to conceive and the patients who failed to conceive were statistically similar in aspect of hysteroscopy type, operative procedures, and histopathological findings (p>0.05 for all) (Table 2).

Table 3 demonstrates the demographic and clinical characteristics of patients with unexplained infertility with respect to live birth. Patients who were able to give birth to living newborns after hysteroscopy

**Table 1.** Demographic and clinical characteristics of the patients with respect to pregnancy

| | Clinical pregnancy, (n=63) | No clinical pregnancy, (n=82) | p |
|---|---|---|---|
| Age (years) | 27.9±4.7 | 30.3±5.9 | 0.008* |
| Gravidity | 0.72±0.49 | 1.17±0.94 | 0.005* |
| Parity | 0.43±0.24 | 0.76±0.56 | 0.001* |
| Body mass index (kg/m$^2$) | 26.76±4.62 | 26.48±4.46 | 0.710 |
| Duration of infertility (years) | 4.0±2.7 | 4.6±3.0 | 0.196 |
| Primary infertility | 40 (63.5%) | 43 (52.4%) | 0.182 |
| Secondary infertility | 23 (36.5%) | 39 (47.6%) | 0.244 |
| Hysteroscopy indication | | | |
| Uterine septum | 26 (41.3%) | 31 (37.8%) | 0.634 |
| Abnormal uterine bleeding | 21 (33.3%) | 33 (40.2%) | 0.636 |
| Uterine septum + abnormal bleeding | 10 (15.9%) | 14 (17.1%) | 0.762 |
| Dysmorphic uterus | 6 (9.5%) | 4 (4.9%) | 0.764 |

*p<0.05 was accepted to be statistically significant.

had significantly younger age, lower gravidity, and parity than patients who failed to deliver living neonates after hysteroscopy (p=0.040, p=0.003 and p=0.001 respectively). The patients who succeeded in delivering living newborns and those who failed to give birth to living neonates were statistically similar with respect to BMI, duration, and type of infertility, and hysteroscopy indication (p>0.05 for all). Moreover, septum resection was significantly more frequent and adhesiolysis was significantly less frequent in patients who were able to give birth to living newborns after hysteroscopy (p=0.038 and p=0.014 respectively). The patients who succeeded in delivering living neonates and those who failed to give birth to living newborns were statistically similar in terms of hysteroscopy type and histopathological findings (Table 4).

**Table 2.** Hysteroscopy findings of the patients with respect to pregnancy

| | Clinical pregnancy, (n=63) | No clinical pregnancy (n=82) | p |
|---|---|---|---|
| Diagnostic hysteroscopy | 28 (44.4%) | 31 (37.8%) | 0.420 |
| Operative hysteroscopy | 35 (55.6%) | 51 (62.2%) | 0.496 |
| **Operative procedure** | | | |
| Septum resection | 10 (28.6%) | 21 (41.2%) | 0.667 |
| Polyp resection | 17 (48.5%) | 19 (37.3%) | 0.663 |
| Isthmocele repair | 5 (14.3%) | 7 (13.7%) | 0.465 |
| Adhesiolysis | 3 (8.6%) | 4 (7.8%) | 0.462 |
| **Histopathological findings** | | | |
| Endometrial polyp | 17 (48.5%) | 19 (37.3%) | 0.753 |
| Proliferative endometrium | 11 (31.5%) | 18 (35.3%) | 0.751 |
| Secretory endometrium | 5 (14.3%) | 10 (19.6%) | 0.308 |
| Chronic endometritis | 2 (5.7%) | 4 (7.8%) | 0.305 |

**Table 3.** Demographic and clinical characteristics of the patients with respect to live birth

| | Live birth, (n=56) | No live birth, (n=89) | p |
|---|---|---|---|
| Age (years) | 28.1±4.8 | 30.0±5.8 | 0.040* |
| Gravidity | 0.71±0.46 | 1.14±0.92 | 0.003* |
| Parity | 0.41±0.21 | 0.74±0.55 | 0.001* |
| Body mass index (kg/m$^2$) | 26.77±4.79 | 26.49±4.36 | 0.717 |
| Duration of infertility (years) | 4.1±2.7 | 4.5±3.0 | 0.520 |
| Primary infertility | 37 (66.1%) | 46 (51.7%) | 0.088 |
| Secondary infertility | 19 (33.9%) | 43 (48.3%) | 0.125 |
| **Hysteroscopy indication** | | | |
| Uterine septum | 25 (44.6%) | 32 (36.0%) | 0.748 |
| Abnormal uterine bleeding | 19 (33.9%) | 35 (39.3%) | 0.744 |
| Uterine septum + Abnormal bleeding | 8 (14.3%) | 16 (18.0%) | 0.457 |
| Dysmorphic uterus | 4 (7.1%) | 6 (6.7%) | 0.452 |

*p<0.05 was accepted to be statistically significant.

## DISCUSSION

The present study yields a clinical pregnancy rate of 43.4% and a live birth rate of 38.6% after hysteroscopy in couples with unexplained infertility. In addition, mode of conception was unassisted in 44.4% of pregnancies. Patients who were able to conceive after hysteroscopy were significantly younger, had lower gravidity, and had parity than those who failed to conceive. Patients who successfully gave birth to living newborns after hysteroscopy were significantly younger, had lower gravidity, and had parity than those who failed to deliver. Septum resection was significantly more frequent and adhesiolysis was significantly less frequent in patients who were able to give birth to living newborns after hysteroscopy.

Hysteroscopy is the gold standard for both the assessment and management of intrauterine pathologies (15). Yet, controversy remains regarding the adoption of hysteroscopy as a primary tool for the initial work-up of infertility (15-18). As an example, the American Society for Reproductive Medicine describes hysteroscopy as a relatively expensive and invasive procedure (16). In parallel, the National Institute for Health and Clinical Excellence has declared that hysteroscopy should not be performed during the primary workup for infertility (17). On the contrary, the Italian Society of Gynecological Endoscopy has highlighted hysteroscopy as a component of the initial screening for infertility (18). Specifically, the European Society of Human Reproduction and Endocrinology does not recommend the use of hysteroscopy for the detection and correction of intrauterine abnormalities that have not been observed by routine imaging in women with unexplained infertility (13,19).

The current treatment of unexplained infertility consists of expectant management, ovarian stimulation combined with IUI and IVF options (19). It has been reported that performing diagnostic hysteroscopy before embryo transfer does not improve pregnancy rates (20). However, a prospective study detected cervical, uterine, and endometrial abnormalities by hysteroscopy in 86% of women with unexplained infertility (21). Similarly, another study found uterine abnormalities in 26.3% of these women by saline infusion

**Table 4.** Hysteroscopy findings of the patients with respect to live birth

| | Live birth, (n=56) | No live birth, (n=89) | p |
|---|---|---|---|
| Diagnostic hysteroscopy | 25 (44.6%) | 34 (38.2%) | 0.442 |
| Operative hysteroscopy | 31 (55.4%) | 55 (61.8%) | 0.552 |
| **Operative procedure** | | | |
| Septum resection | 15 (48.4%) | 13 (23.6%) | 0.038* |
| Polyp resection | 13 (41.9%) | 26 (47.3%) | 0.126 |
| Isthmocele repair | 3 (9.7%) | 9 (16.4%) | 0.158 |
| Adhesiolysis | 0 (0.0%) | 7 (12.7%) | 0.014* |
| **Histopathological findings** | | | |
| Endometrial polyp | 13 (48.5%) | 26 (47.2%) | 0.255 |
| Proliferative endometrium | 12 (31.5%) | 11 (20.0%) | 0.257 |
| Secretory endometrium | 5 (14.3%) | 14 (25.5%) | 0.572 |
| Chronic endometritis | 1 (5.7%) | 4 (7.3%) | 0.626 |

*p<0.05 was accepted to be statistically significant.

sonography (22). Therefore, this study was designed to determine how undergoing hysteroscopy contributes to the reproductive rates of women with unexplained infertility.

The age of the couple is a crucial factor in fecundity rates, and especially the female age is a significant predictor of the clinical pregnancy rate in couples with unexplained infertility (1,3). As the female age exceeds 35 years, the number and quality of oocytes decrease rapidly. A major reason for this decline is the accumulation of metabolites within the ovarian microenvironment, which can lead to genetic mutations and telomere shortening (1,23). Similarly, the patients who were able to conceive and deliver living newborns after hysteroscopy had significantly younger age, and, thus, lower gravidity and parity than the remaining patients in this study.

A meta-analysis of 10 randomized controlled trials reported that live birth altered between 9% and 28% in couples receiving ovarian stimulation, 11% and 33% in couples undergoing IUI, 15% and 37% in couples having ovarian stimulation combined with IUI, and 14% to 47% in couples undergoing IVF due to unexplained infertility when the live birth rate was 17% in unassisted couples (24). In a study assessing young women with unexplained infertility and diminished ovarian reserve, the live birth rate was 11.3% for women receiving IUI and 22.6% for women having IVF treatment (25). A randomized controlled trial was conducted to designate the optimal treatment for unexplained infertility by evaluating long-term reproductive outcomes. The live birth rate was 67.8% during this one-year-long trial of 286 couples with unexplained infertility, and the overall live birth rate reached to 80.9% after the trial. The live birth rate was 64.3% in unassisted couples, whereas the live birth rate was 5.3% in couples undergoing IUI and 36.4% in couples having IVF treatment (26).

As for the present study, the clinical pregnancy rate was 43.4% while live birth rate was 38.6% in a cohort of 145 women with unexplained infertility. The mode of conception was unassisted in 44.4% of the pregnancies, whereas the mode of conception was ovarian stimulation combined with IUI in 36.5 of the pregnancies and IVF in 19.1% of the pregnancies. Compared with the literature, the discrepancies in the clinical pregnancy and live birth rates in this study could be attributed to heterogeneity in the cohort size and characteristics.

A uterine septum is a congenital uterine malformation that divides the uterine cavity into two by a longitudinal wall-like tissue and maintains the typically normal exterior contour of the uterus (27). The septate uterus itself is not considered as a reason for infertility, but it might interfere with the natural conception. On the other hand, the uterine septum is related with unfavorable pregnancy outcomes (27-30). Hysteroscopy provides definitive diagnosis and treatment for this most common uterine anomaly (28).

A meta-analysis of 7 studies emphasizes that hysteroscopic septum resection lowers the miscarriage rate (27). Another meta-analysis of 55 studies indicated that hysteroscopic resection significantly reduces the risk of miscarriage in patients with a septate uterus. Yet, hysteroscopic metroplasty exerts no significant effect on clinical pregnancy, live birth, or preterm delivery rates (28). A recent meta-analysis concluded that hysteroscopic septum resection significantly increases the rate of live births and decreases the rate of miscarriage in patients with recurrent pregnancy loss or primary infertility. However, the same efficiency of hysteroscopic resection does not take effect in patients with secondary infertility (29). Another recent meta-analysis specified the adverse effects of the uterine septum on reproductive and perinatal outcomes and showed that hysteroscopic treatment improves miscarriage rates (30).

Complying with literature, the patients who succeeded to conceive and the patients who failed to conceive were statistically similar with respect to hysteroscopic procedures in this study. Correspondingly, septum resection was significantly more frequent in patients who gave birth to living newborns after undergoing hysteroscopy.

Intrauterine adhesion refers to the presence of synechiae that can end up with the partial or total disruption of the uterine cavity and eventual impairment in the uterine shape. Infectious and/or traumatic damage to the basal layer of the endometrium results in intrauterine adhesion, which is occasionally associated with Asherman syndrome (31). The success rate of hysteroscopy has been found to be 95% in a cohort of 638 women diagnosed with Asherman syndrome (32). Therefore, it has been hypothesized that hysteroscopy optimizes fertility outcomes by accurately diagnosing intrauterine adhesions and their obliteration (33). In contrast, the prevalence of hysteroscopic adhesiolysis was significantly lower in women who successfully delivered living neonates after hysteroscopy. This contradictory finding can be due to the relatively higher recurrence risk of intrauterine adhesions and the association between intrauterine adhesions and poor reproductive outcomes (33,34).

## CONCLUSION

Consequently, the findings of the present study suggest that hysteroscopy has a positive impact on the live birth rate of women diagnosed with unexplained infertility. However, these findings

Should be interpreted carefully because their power is limited by the relatively small cohort size and the variations in the sociodemographic and clinical features of the participants. Further research is warranted to clarify the role of hysteroscopy in the reproductive success of women with unexplained infertility.

### *Ethics*

**Ethics Committee Approval:** This prospective cohort study was approved by the Ethics Committee of Afyonkarahisar Health Sciences University where it was undertaken (approval number: 2023/12/497, date: 01.12.2023).

**Informed Consent:** Each participant was informed about the study, and written informed consent was obtained from all participants.

### *Authorship Contributions*

Concept: R.D., B.A., A.Y.Y., C.Y.Ö., M.K.P., Design: R.D., B.A., A.Y.Y., C.Y.Ö., M.K.P., Supervision: R.D., M.K.P., Resources: C.Y.Ö., Materials: R.D., B.A., A.Y.Y., Data Collection or Processing: R.D., B.A., A.Y.Y., Analysis or Interpretation: R.D., B.A., A.Y.Y., M.K.P., Literature Search: R.D., C.Y.Ö., Writing: R.D., M.K.P., Critical Review: M.K.P.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

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