

Prognosis of Pregnancies Complicated by OHSS Following Ovulation Induction: A Retrospective Analysis

Ovulasyon İndüksiyonu Sonrası OHSS ile Komplike Olan Gebeliklerin Prognozu: Retrospektif Bir Analiz

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Abstract

Objective: This research investigates pregnancy outcomes in women who developed ovarian hyperstimulation syndrome (OHSS) after ovulation induction, with a focus on both maternal and newborn health. The study further explored how OHSS relates to unfavorable pregnancy outcomes, including the need for neonatal intensive care, the occurrence of multiple gestations, and complications affecting the mother.

Methods: Between January 2019 and August 2022, a retrospective evaluation was carried out in one tertiary-level hospital. The study population consisted of pregnant women who developed OHSS following ovulation induction. Data on demographic features, clinical findings, laboratory measurements, and pregnancy-related results were collected. Comparative statistical analyses were used to examine how OHSS influenced both maternal and newborn complications.

Results: The mean age of the study population was 31.1±5.1 years, and the mean body mass index was 30.5±1.4 kg/m². In vitro fertilization was the most commonly applied assisted reproductive technique, used in 60.0% of cases. Clinical symptoms were prevalent, with abdominal pain reported in 86.7% of patients, and nausea/vomiting in 73.3% of patients. The live birth rate was 66.7%, while pregnancy loss occurred in 33.3% of cases. Multiple pregnancy was present in 40.0% of cases, and neonatal intensive care unit (NICU) admission was required in 50.0% of newborns, with a statistically significant association between NICU admission and multiple pregnancy (p=0.010). Maternal adverse outcomes were observed in 63.6% of cases, and these were significantly correlated with higher albumin levels (p=0.002) and lower gestational age (p=0.030). However, OHSS was not identified as an independent risk factor for cesarean delivery, preterm birth, or pregnancy loss.

Conclusion: Our findings align with existing literature suggesting that OHSS is associated with neonatal morbidity and maternal complications but may not be an independent risk factor for adverse pregnancy outcomes. Differences in patient populations and inclusion criteria may explain variations across studies. To clarify the long-term influence of OHSS on pregnancy outcomes, additional research with broader sample sizes and prospective designs is required.

Keywords: Ovarian hyperstimulation syndrome, pregnancy complications, neonatal outcomes, maternal prognosis, in vitro fertilization



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Öz

Amaç: Bu çalışmanın amacı, ovulasyon indüksiyonu sonrası gelişen over hiperstimülasyon sendromu (OHSS) ile komplike olmuş gebeliklerde maternal ve neonatal prognozu değerlendirmektir. OHSS ile yenidoğan yoğun bakım ünitesi yatışı, çoğul gebelik ve maternal komplikasyonlar gibi olumsuz gebelik sonuçları arasındaki ilişki incelenmiştir.

Yöntem: Bu retrospektif çalışma, tek merkezli bir üçüncü basamak sağlık kuruluşunda gerçekleştirilmiş olup Ocak 2019 ile Ağustos 2022 tarihleri arasında ovulasyon indüksiyonu sonrası OHSS tanısı alan gebe hastalar dahil edilmiştir. Demografik özellikler, klinik semptomlar, biyokimyasal parametreler ve gebelik sonuçları analiz edilmiştir. OHSS'nin maternal ve neonatal komplikasyonlar üzerindeki etkisini değerlendirmek amacıyla istatistiksel karşılaştırmalar yapılmıştır.

Bulgular: Çalışma grubunun ortalama yaşı $31,1 \pm 5,1$ yıl, ortalama vücut kitle indeksi ise $30,5 \pm 1,4$ kg/m² idi. Yardımcı üreme teknikleri arasında en sık uygulanan yöntem %60,0 oranıyla in vitro fertilizasyon oldu. Klinik semptomlar yaygındı; hastaların %86,7'sinde abdominal ağrı, %73,3'ünde ise bulantı/kusma mevcuttu. Canlı doğum oranı %66,7 iken, gebelik kaybı %33,3 oranında gerçekleşti. Olguların %40,0'ında çoğul gebelik mevcuttu ve yenidoğanların %50,0'si yenidoğan yoğun bakım ünitesine yatırıldı. Çoğul gebelik ile yenidoğan yoğun bakım ünitesi yatışı arasında istatistiksel olarak anlamlı bir ilişki saptandı ($p=0,010$). Maternal advers sonuçlar %63,6 oranında gözlemlendi ve bu durum yüksek albümin düzeyleri ($p=0,002$) ile düşük gebelik yaşı ($p=0,030$) ile anlamlı şekilde ilişkiliydi. Bununla birlikte, OHSS sezaryen doğum, preterm doğum ya da gebelik kaybı için bağımsız bir risk faktörü olarak tanımlanmadı.

Sonuç: Bulgularımız, OHSS'nin neonatal morbidite ve maternal komplikasyonlarla ilişkili olduğunu ancak olumsuz gebelik sonuçları açısından bağımsız bir risk faktörü olmayabileceğini öne süren mevcut literatürle uyumludur. Farklı hasta grupları ve çalışma kriterleri, çalışmalar arasındaki bulgu farklılıklarını açıklayabilir. OHSS'nin gebelik sonuçları üzerindeki uzun vadeli etkilerini daha iyi anlayabilmek için ileriye dönük, geniş ölçekli çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Over hiperstimülasyon sendromu, gebelik komplikasyonları, neonatal sonuçlar, maternal prognoz, in vitro fertilizasyon

Introduction

Ovulation induction and controlled ovarian hyperstimulation (COH) are commonly used methods in infertility treatment⁽¹⁾. However, ovarian hyperstimulation syndrome (OHSS) may develop as a result of an excessive response to gonadotropins (Gn) during these processes⁽²⁾. OHSS is an iatrogenic complication characterized by excessive ovarian stimulation and increased vascular permeability, which potentially life-threatening⁽³⁾. While mild cases present with symptoms such as abdominal distension and nausea, severe forms may lead to ascites, pleural effusion, hemoconcentration, and thromboembolic complications⁽⁴⁾.

Multiple factors have been associated with the onset of OHSS. These include conditions such as polycystic ovary syndrome (PCOS), younger maternal age, low body mass index (BMI), increased ovarian follicle count, higher anti-Müllerian hormone (AMH) concentrations, and a prior history of OHSS^(5,6). Among them, the use of human chorionic Gn (hCG) for ovulation induction is particularly important, as this hormone significantly contributes to OHSS pathogenesis. The condition is generally divided into two types: early and late. The early form typically arises within 10 days after administration of hCG, while the late type is more often linked to the natural production of hCG during pregnancy⁽⁷⁾.

The effects of OHSS-complicated pregnancies on maternal and fetal prognosis have not been fully elucidated. The

current literature contains a limited number of studies on the impact of OHSS on pregnancy outcomes. It has been suggested that pregnancies affected by OHSS have a higher incidence of complications such as miscarriage, preterm birth, low birth weight (LBV), and hypertensive disorders⁽⁸⁾. However, these findings may vary due to differences in patient populations and treatment protocols.

The aim of this study is to evaluate the prognosis of pregnancies complicated by OHSS following ovulation induction and COH. In our study, pregnancy outcomes of these patients (such as miscarriage, preterm birth, and birth weight) were retrospectively analyzed, and the impact of OHSS on pregnancy progression was discussed in light of the obtained data.

Materials and Methods

This retrospective study was conducted at the University of Health Sciences Türkiye, Etlik Zübeyde Hanım Gynecology Training and Research Hospital, to evaluate the clinical and obstetric prognosis of patients who were hospitalized due to OHSS and had ongoing pregnancies between January 2019 and August 2022. Ethical approval for the study was obtained from the University of Health Sciences Türkiye, Etlik Zübeyde Hanım Gynecology Training and Research Hospital (approval no: 11, date: 06.09.2022), and patient data were retrospectively reviewed from hospital records.

Study Group and Inclusion Criteria

The study included patients aged between 18 and 45 years who developed OHSS following ovulation induction and COH, had ongoing pregnancies. The selection of these patients was based on the regular follow-up of their pregnancies at our hospital and the availability of complete clinical and obstetric records. The study population was determined by selecting patients who were diagnosed with OHSS after infertility treatment and who had continuing pregnancies.

Exclusion Criteria

Patients excluded from the study included those younger than 18 or older than 45 years, those whose pregnancy follow-ups were not conducted regularly or whose records were inaccessible, and those who developed OHSS but did not achieve pregnancy. Furthermore, individuals with long-standing systemic illnesses-including conditions like diabetes, high blood pressure, or autoimmune diseases-that might influence pregnancy outcomes were excluded from the study. These criteria were established to eliminate other potential confounding variables and to assess pregnancy outcomes solely in the context of OHSS.

Data Collection and Evaluation Method

Patient data were retrospectively obtained from the hospital automation system and patient records. The parameters analyzed in the study included demographic data, OHSS severity, clinical findings, and pregnancy outcomes. Demographic data encompassed patient age, BMI, infertility duration, ovulation induction protocol, AMH level, estradiol (E2) levels, stimulation duration, and the total Gn dose used. The severity of OHSS was classified as mild, moderate, or severe according to the American Society for Reproductive Medicine classification⁽⁹⁾.

Clinical Findings and Pregnancy Outcomes

In terms of clinical findings, patients were evaluated for abdominal pain, nausea and vomiting, oliguria, presence of ascites, hematocrit (Hct) levels, electrolyte imbalances, and hospital stay duration. Regarding pregnancy progression and outcomes, parameters such as abortion (early and late), preterm birth (<37 weeks), mode of delivery (vaginal or cesarean), birth weight, and neonatal intensive care unit (NICU) requirement were analyzed. These data were retrospectively examined to assess the impact of OHSS on pregnancy outcomes.

Statistical Analysis

Statistical analyses were performed with IBM SPSS Statistics, version 27.0 (IBM Corp., Armonk, NY, USA). Continuous data are summarized as mean \pm standard deviation (SD), whereas categorical data are shown as numbers and percentages. The distribution of variables was checked using Kolmogorov-Smirnov and Shapiro-Wilk tests. When the data followed a normal distribution, comparisons were made with the independent t-test; otherwise, the Mann-Whitney U test was applied. For categorical comparisons, either the chi-square test or Fisher's exact test was used. A p-value less than 0.05 was regarded as the threshold for statistical significance.

Results

The mean age of the patients included in the study was calculated as 31.1 \pm 5.1 years. The mean BMI was found to be 30.5 \pm 1.4 kg/m². Regarding obstetric history, the mean gravidity was determined to be 1.2 \pm 0.4, parity was 0.2 \pm 0.4, and the number of living children was 0.3 \pm 0.6.

Sixty percent (60.0%) of the patients underwent in vitro fertilization (IVF), making it the most common treatment modality compared to other methods. In terms of clinical symptoms, 86.7% of the patients reported abdominal pain, 73.3% experienced nausea and vomiting, and oliguria was observed in 13.3% of the patients.

The mean birth weight of the patients was calculated as 2840.0 \pm 380.4 g, and the mean gestational age was determined as 36.3 \pm 3.2 weeks. In cases of abortion, the mean gestational age at abortion was found to be 8.6 \pm 3.3 weeks. Regarding biochemical parameters, the mean Hct level was 38.5 \pm 4.5, the serum sodium (Na) level was 133.9 \pm 3.2 mmol/L, and the potassium (K) level was 4.1 \pm 0.5 mmol/L. The albumin level showed high variation (9.2 \pm 12.7 g/dL).

Among the patients included in the study, 6.7% underwent albumin replacement therapy, while none underwent paracentesis. The live birth rate was determined to be 66.7%, whereas pregnancy loss (abortion) occurred in 33.3% of cases. Regarding the mode of delivery, vaginal delivery was observed in 26.7% of the patients, while 40.0% underwent cesarean section. The multiple pregnancy rate was found to be 40.0%, and 50.0% of the patients required admission to the NICU.

In pregnancies requiring NICU admission, the rate of multiple pregnancies was found to be significantly higher (80.0% vs. 0.0%, p=0.010). However, when evaluating the

mode of delivery among neonates requiring NICU admission, the cesarean section rate was higher (80.0%), though this difference was not statistically significant ($p=0.197$). Other parameters associated with NICU admission were also examined. Abdominal pain was more frequently observed in the group requiring NICU admission (100.0% vs. 60.0%, $p=0.114$), although statistical significance was not reached. Additionally, no significant association was found between NICU admission and factors such as albumin replacement, oliguria, or COH ($p>0.05$) (Table 1).

Across the treatment groups, there were no meaningful statistical differences in age, BMI, electrolyte parameters (Na and K), Hct, or albumin levels ($p>0.05$). In terms of neonatal outcomes, the clomiphene citrate (CC)+intrauterine insemination (IUI) group showed the highest average birth weight (3240.0 ± 84.9 g), whereas the recombinant follicle-stimulating hormone (rFSH)+IUI and IVF groups had lower values; nevertheless, this variation did not reach statistical significance ($p=0.277$). The average gestational period was slightly longer in the CC+IUI group (39.0 ± 2.8 weeks) and shorter in the rFSH+IUI and IVF groups, though again the difference between groups was not significant ($p=0.444$). Likewise, gestational age at abortion showed no notable variation across groups ($p=0.842$) (Table 2).

In the group with maternal adverse outcome, the albumin level was measured as 7.4 ± 10.9 g/dL, whereas in the group

without maternal adverse outcome, it was 2.7 ± 0.4 g/dL ($p=0.002$). The gestational age was 35.3 ± 3.1 weeks in the group with maternal adverse outcome and 38.7 ± 2.1 weeks in the group without the adverse outcome ($p=0.030$). There was no statistically significant difference between the groups with and without maternal adverse outcome in terms of age, BMI, Na, K, and Hct levels ($p>0.05$) (Table 3).

Discussion

In our study, IVF was identified as the most frequently preferred assisted reproductive technique, with a higher application rate compared to other treatment modalities. Regarding clinical symptoms, the majority of patients were found to experience abdominal pain, nausea, and vomiting as predominant complaints. The frequency of multiple gestations was notably increased among cases that required NICU admission. While cesarean deliveries occurred more often in the NICU group, the variation did not reach statistical significance. Additionally, a significant association was observed between maternal adverse pregnancy outcomes and both albumin levels and gestational age. These findings emphasize the need for careful evaluation of maternal and neonatal outcomes during the application of assisted reproductive techniques, and they highlight the impact of multiple pregnancies on neonatal morbidity, which should not be overlooked.

Table 1. Comparison of clinical and obstetric parameters based on NICU admission in patients with OHSS

		NICU admission (-) (n=5)	NICU admission (+) (n=5)	
		Count (%)	Count (%)	p-value*
CC+IUI		2 (40%)	0 (0%)	0.114
COH		0 (0%)	1 (20%)	0.292
IVF		3 (60%)	4 (80%)	0.490
Nausea/vomiting		4 (80%)	4 (80%)	1.00
Abdominal pain		3 (60%)	5 (100%)	0.114
Oliguria		0 (0%)	1 (20%)	0.292
Albumin replacement		0 (0%)	1 (20%)	0.292
Paracentesis		0 (0%)	0 (0%)	-
Live birth		5 (100%)	5 (100%)	-
Mode of delivery	Vaginal	3 (60%)	1 (20%)	0.197
	C/S	2 (40%)	4 (80%)	
Multiple pregnancy		0 (0%)	4 (80%)	0.010

Data in the table are presented as number (percentage), statistically significant p-values are indicated in bold

*: Fisher's exact test, OHSS: Ovarian hyperstimulation syndrome, CC: Clomiphene citrate, IUI: Intrauterine insemination, COH: Controlled ovarian hyperstimulation, IVF: In vitro fertilization, C/S: Cesarean section, NICU: Neonatal intensive care unit

Table 2. Comparison of demographic, biochemical, and pregnancy outcomes among different treatment modalities in patients with OHSS

	CC+IUI (n=2)	rFSH+IUI (n=4)	IVF (n=9)	
	Mean ± SD	Mean ± SD	Mean ± SD	p-value
Age (years)	28.5±0.7	34.3±6.8	30.2±4.4	0.333 ^a
BMI (kg/m ²)	31.0±2.8	29.8±1.0	30.7±1.3	0.505 ^a
Na (mmol/L)	137.5±0.7	132.0±2.9	133.9±3.1	0.143 ^a
K (mmol/L)	3.8±0.4	4.4±0.3	4.0±0.5	0.225 ^a
Hct (%)	36.0±4.2	39.0±3.9	38.9±5.1	0.726 ^a
Albumin (g/dL)	3.7±0.9	11.2±15.9	9.6±13.3	0.807 ^b
Birth weight (gr)	3240.0±84.9	2725.0±.	2742.1±386.2	0.277 ^a
Gestational age (weeks)	39.0±2.8	35.0±.	35.7±3.3	0.444 ^a
Gestational week of abortion	.	8.7±4.6	8.5±0.7	0.842

^a: One-way ANOVA t-test, ^b: Kruskal-Wallis test, OHSS: Ovarian hyperstimulation syndrome, CC: Clomiphene citrate, IUI: Intrauterine insemination, rFSH+IUI: Recombinant follicle-stimulating hormone+intrauterine insemination, IVF: In vitro fertilization, SD: Standard deviation, BMI: Body mass index, Na: Sodium, K: Potassium, Hct: Hematocrit

Table 3. Comparison of demographic and clinical characteristics in OHSS patients with and without maternal adverse outcomes

	Maternal adverse outcome (-) (n=4)	Maternal adverse outcome (+) (n=7)	
	Mean ± SD	Mean ± SD	p-value
Age (years)	28.3±3.2	32.7±4.2	0.084 ^c
BMI (kg/m ²)	31.0±1.2	30.3±1.8	0.498 ^c
Na (mmol/L)	133.8±4.2	134.7±2.9	0.662 ^c
K (mmol/L)	3.9±0.4	4.1±0.6	0.535 ^c
Hct (%)	39.5±7.7	38.3±2.9	0.780 ^c
Albumin (g/dL)	2.7±0.4	7.4±10.9	0.002^d
Gestational age (weeks)	38.7±2.1	35.3±3.1	0.030^c

Data in the table are presented as mean ± SD, statistically significant p-values are indicated in bold
^c: Independent Samples t-test, ^d: Mann-Whitney U test, OHSS: Ovarian hyperstimulation syndrome, SD: Standard deviation, BMI: Body mass index, Na: Sodium, K: Potassium, Hct: Hematocrit

Increasing maternal age plays a major role in fertility, as it gradually reduces reproductive capacity. This reduction is mainly linked to diminished ovarian reserve, poorer oocyte characteristics, and a higher likelihood of embryonic chromosomal abnormalities⁽¹⁰⁻¹²⁾. Conversely, younger women with elevated antral follicle counts (AFCs), higher serum E2 concentrations, and larger retrieval of oocytes face a greater probability of experiencing OHSS. Evidence from two prospective and five retrospective studies assessing the relationship between age and OHSS incidence has confirmed that younger age serves as a significant risk factor⁽¹²⁻¹⁶⁾. BMI is another patient-specific factor evaluated in relation to both the risk and severity of OHSS. The starting dose of Gn in COH

is adjusted according to individual patient features, such as BMI. Results from a prospective cohort study showed that women with a BMI ≥ 25 kg/m² produced fewer mature oocytes, required greater amounts of rFSH, and were at elevated risk for severe OHSS⁽¹⁷⁾. In a separate study, Sun et al.⁽¹⁸⁾ evaluated predictors of OHSS severity and reported that low BMI, high AFC, and increased baseline E2 concentrations were all strongly linked to OHSS occurrence. Our study observed that the majority of patients had undergone IVF and that NICU admission in OHSS cases was significantly associated with multiple pregnancies. Consistent with the findings of Sun et al.⁽¹⁸⁾, our study also demonstrated that patients who developed OHSS had a high prevalence of symptoms such as

abdominal pain and nausea/vomiting. However, while Sun et al.⁽¹⁸⁾ emphasized that BMI was an important determinant of OHSS development, our study did not find a significant association between BMI and NICU admission or pregnancy prognosis. This discrepancy may be attributed to differences in patient populations or the inclusion of groups beyond those with PCOS. Therefore, in the clinical management of OHSS, individual patient characteristics such as BMI should be considered, while also acknowledging that factors influencing neonatal outcomes are multifactorial.

A previous case-control study reported a positive correlation between prolonged hospitalization due to OHSS and an increased risk of miscarriage. Additionally, the study suggested that hospitalization for OHSS might be a negative factor in achieving and maintaining pregnancy in patients undergoing IVF treatment⁽¹⁹⁾. In our study, pregnancy loss (abortion) was observed in 33.3% of patients diagnosed with OHSS. This finding may support the potential association between OHSS and pregnancy loss as suggested in the literature.

Hospitalizations related to OHSS not only impose a significant economic burden but also negatively impact patients' mental well-being following IVF-embryo transfer⁽²⁰⁾. However, factors such as racial and regional differences, variations among hospitals, and discrepancies in research methodologies may influence the observed effects of OHSS on pregnancy outcomes. Additionally, baseline patient characteristics and the severity of OHSS can affect the interpretation of clinical research findings. Up to now, the influence of OHSS on pregnancy outcomes has not been thoroughly explored, underlining the necessity for additional studies^(21,22). Hu et al.⁽²³⁾ investigated maternal and neonatal outcomes in pregnancies affected by moderate to severe OHSS and reported notably increased incidences of venous thrombosis, gestational diabetes mellitus (GDM), and admissions to NICU among these patients. Furthermore, the duration of pregnancy was shorter in the OHSS group compared with the control cohort, yet no statistically significant variation was observed in live birth rates. In addition, OHSS was not considered an independent predictor for adverse outcomes such as LBW, preterm delivery, or gestational hypertension. In the study by Vainer-Rotbart et al.⁽⁶⁾, maternal and perinatal complications in pregnancies affected by OHSS were evaluated through a large-scale retrospective analysis. The findings indicated that OHSS is not considered an independent determinant

of adverse pregnancy outcomes, including preeclampsia, GDM, intrauterine growth restriction, preterm delivery (<37 and <34 weeks), low and very LBW, and cesarean section. Nevertheless, in a subgroup analysis focusing on IVF patients, OHSS showed a significant association with preterm birth occurring before 34 weeks of gestation. In our study, maternal adverse pregnancy outcomes were found to be significantly associated with higher albumin levels and a lower gestational age. Moreover, multiple gestations were observed more frequently in cases that required NICU care. Consistent with the results reported by Vainer-Rotbart et al.,⁽⁶⁾ our analysis showed that despite the elevated rate of cesarean sections, OHSS itself did not emerge as an independent determinant for cesarean delivery. However, while Vainer-Rotbart et al.,⁽⁶⁾ reported that OHSS was not associated with preterm birth, our study found a significant correlation between gestational age and maternal adverse outcomes, suggesting that OHSS may have an indirect impact on pregnancy duration. Such inconsistencies might be explained by variations in study populations or the criteria used for participant selection. To gain clearer insights into how OHSS influences maternal and newborn outcomes, especially in IVF-associated pregnancies, extended longitudinal research will be required.

Study Limitations

This study has several limitations. First, due to its retrospective design, data collection was based on patient records. This approach carries the risk of missing data and observational bias. More comprehensive and controlled data could be obtained through prospective studies. Second, our study is single-center, and the patient population is limited to the hospital records of a specific institution. This limitation may affect the generalizability of the results. Larger, multicenter studies are necessary to better evaluate the impact of OHSS on maternal and neonatal outcomes. Lastly, our study did not analyze in detail the effects of hospital stay duration due to OHSS or specific treatment approaches (e.g., albumin replacement or anticoagulant use) on long-term pregnancy outcomes. Future prospective studies investigating the long-term effects of OHSS on maternal and neonatal prognosis could further expand our understanding in this field.

Conclusion

This study aimed to evaluate the impact of OHSS on maternal and neonatal prognosis in complicated pregnancies. Our findings indicate that OHSS is significantly associated with NICU admission and multiple pregnancies. Additionally,

maternal adverse pregnancy outcomes were found to be associated with higher albumin levels and lower gestational age. While the literature presents varying results regarding the effects of OHSS on pregnancy, our study supports the notion that OHSS may be particularly linked to neonatal morbidity and maternal complications. However, further large-scale and prospective studies are needed to determine whether OHSS is an independent risk factor for pregnancy loss, preterm birth, and obstetric complications. In conclusion, the management of pregnancies complicated by OHSS requires careful monitoring and a multidisciplinary approach. Early diagnosis, maintaining proper fluid-electrolyte balance, and close monitoring of high-risk patients may contribute to improved maternal and neonatal outcomes. Future large-scale and long-term follow-up studies are necessary to better elucidate the effects of OHSS on pregnancy progression and birth outcomes.

Ethics

Ethics Committee Approval: Ethical approval for the study was obtained from the University of Health Sciences Türkiye, Etlik Zübeyde Hanım Gynecology Training and Research Hospital (approval no: 11, date: 06.09.2022).

Informed Consent: Patient data were retrospectively reviewed from hospital records.

Footnotes

Authorship Contributions

Concept: Ay.K., Ö.V.A., Design: Ay.K., Ah.K., Data Collection or Processing: Az.K., Ah.K., Analysis or Interpretation: Ay.K., Ö.V.A., Literature Search: Az.K., Writing: Ay.K., Ö.V.A.

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

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