

## Urogynecological symptoms of the retroverted gravid uterus in the first half of the pregnancy: A retrospective cohort study of an underestimated, underdiagnosed and underreported issue

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### Ethics Committee Approval

The approval was taken from the Ethics Committee of Istanbul Professor Doctor Cemil Taşcıoğlu State Hospital (date: July 1, 2019, number: 48670771-514.10).

All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

### Conflict of Interest

No conflict of interest was declared by the authors.

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### Abstract

**Background/Aim:** Urogynecological symptoms, including pelvic pain, lower backache, feeling of bearing down, frequency, nocturia, urgency, stress incontinence, and urge incontinence, are common during pregnancy. But little has been reported regarding possible changes in lower urogenital tract anatomy and its effects in pregnancy. Therefore, the subject of this study is whether the incidence of urogynecological symptoms is higher when the uterus is retroverted in pregnancy.

**Methods:** We enrolled 1432 pregnant women examined before the 20th week of pregnancy between January 2018 and March 2022. Patients were allocated into two groups according to whether the uterus was retroverted (n=226 (15.7%)) or anteverted (n=1206 (84.3%)). These two groups were compared regarding pelvic pain, lower backache, the feeling of bearing down, frequency, nocturia, urgency, stress incontinence, and urge incontinence.

**Results:** Retroverted gravid uterus was noted in 11.8% (n=41) of nulliparae and 17% (n=185) of multiparae (P=0.021), with an overall prevalence of 15.7%. Of 1432 patients, the overall prevalence for frequency, urgency, nocturia, urge incontinence, stress incontinence, lower backache, pelvic pain, and feeling of bearing down were 31%, 26.7%, 18.2%, 5.4%, 7.5%, 6.9%, 56.4% and 7.5%, respectively. Between both groups, there were differences in frequency, urgency, nocturia and lower back pain. There were two patients with incarcerated gravid uterus with urinary retention.

**Conclusion:** Patients with a retroverted uterus are more likely to experience the symptoms of lower back pain, frequency, nocturia, and urgency in the first half of pregnancy.

**Keywords:** retroverted uterus, pregnancy, lower back pain, lower urinary tract symptoms

## Introduction

The retroverted uterus has been reported as a normal variant, and its prevalence has been documented as 20% in the general population and up to 15% in pregnancies in the first trimester [1-3]. In most cases, retroversion spontaneously returns to a normal axial position by the 14th week of gestation when the gravid uterus grows into the abdominal cavity. Increased glomerular filtration rate, increased urinary output, and dilation of the upper urinary tract, which are the effects of pregnancy on renal function, have been well documented. On the other hand, relatively little has been reported regarding possible changes in lower genital tract anatomy and its effects during pregnancy. Cystoscopically, it was revealed that an enlarged gravid uterus could cause an indentation on the bladder dome that may affect lower urologic symptoms [4]. Urogynecological symptoms are common during pregnancy, including pelvic pain, lower backache, the feeling of bearing down, frequency, nocturia, urgency, stress incontinence, and urge incontinence.

During pregnancy, the genitourinary system undergoes anatomical and physiological alterations because of hormonal effects and the gravid uterus. The thought that a retroverted gravid uterus has an additional effect on urogynecological symptoms is reasonable sense. Therefore, the subject of this study is whether the incidence of urogynecological symptoms is higher when the uterus is retroverted in pregnancy.

## Materials and methods

This trial was carried out in the Obstetrics and Gynecology Department of the University of Health Science, Istanbul Professor Doctor Cemil Taşçıoğlu State Hospital. We enrolled 1432 pregnant women that were examined before 20 weeks of gestational age between January 2016 and June 2019. Ethics Committee approval was taken from the same institution's Ethics Committee (date: July 1, 2019, number: 48670771-514.10). All procedures in this trial, including human participants, were conducted following the 1964 Helsinki Declaration and its later amendments.

Patient data were extracted from a computer system, and files were retrospectively evaluated. Maternal age, parity, gestational age, the complaints (pelvic pain, lower backache, feeling of bearing down, frequency, nocturia, urgency, stress incontinence, urge incontinence), and clinical and sonographic findings at presentation were noted. The exclusion criteria included urinary tract infection, leiomyoma, adnexal mass, congenital Mullerian anomaly, endometriosis, and urological and gastrointestinal diseases.

Patients were allocated into two groups according to whether the uterus was retroverted (n=226 (15.7%)) or anteverted (n=1206 (84.3%)). These two groups were compared in terms of mentioned findings above. Then, the retroverted group was divided into two subgroups: 12 weeks and below and above 12 weeks. These two subgroups were compared in terms of the symptoms of frequency, nocturia, urgency, and lower back pain.

Frequency is at least 7-day voids and one night-time void [5]. Nocturia is depicted as at least three night-time voids

[6]. Urgency is defined as a sudden, compelling desire to pass urine which is difficult to defer [7].

## Statistical analysis

All analysis was performed using SPSS software (Statistical Package for the Social Sciences, version 25.0, SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to evaluate the eligibility of the data for normal distribution. While an independent t-test or Mann-Whitney U test was used for continuous variables, data with categorical variables were compared using the chi-square test. Descriptive statistics were used to calculate each variable's frequency, central tendency (mean, median), and dispersion (SD, maximum - minimum) when appropriate. In other words, if the variables follow the normal distribution, it was stated as mean (SD); if not, it was noted as median and minimum-maximum. A *P*-value <0.05 has been considered statistically significant.

## Results

The retroverted gravid uterus was noted in 11.8% (n=41) of nulliparae and 17% (n=185) of multiparous (*P*=0.021), with an overall prevalence of 15.7%. Median values of gestational ages were the same in both groups; 12 (5–20). The proportions of subjects in gestational age groups were similar (*P*=0.647) (Table 1). The mean maternal age at diagnosis was 29.38 (6.48) and 29.37 (6.06) weeks in retroverted and anteverted groups, respectively (*P*=0.997). Median values of parity in retroverted and anteverted groups were 1 (0–4) and 1 (0–5), respectively (*P*=0.026). The median value of body mass indices was 23.4 (21.7-29.8) and 23.2 (22.5–26.8) in retroverted and anteverted groups, respectively, and there was no statistical significance between the groups (*P*=0.949).

Table 1: The proportions of subjects in gestational age groups.

Gestational age (weeks)	Retroverted group n (%)	Anteverted group n (%)	Total n (%)
5	8 (3.5)	32 (2.7)	40 (2.8)
6	8 (3.5)	34 (2.8)	42 (2.9)
7	7 (3.1)	42 (3.5)	49 (3.4)
8	16 (7.1)	90 (7.5)	106 (7.4)
9	20 (8.8)	114 (9.5)	134 (9.4)
10	16 (7.1)	80 (6.6)	96 (6.7)
11	26 (11.5)	118 (9.8)	144 (10.1)
12	27 (11.9)	145 (12)	172 (12)
13	33 (14.6)	188 (15.6)	221 (15.4)
14	20 (8.8)	119 (9.9)	139 (9.7)
15	12 (5.3)	73 (6.1)	85 (5.9)
16	13 (5.8)	78 (6.5)	91 (6.4)
17	5 (2.2)	23 (1.9)	28 (2)
18	6 (2.7)	28 (2.3)	34 (2.4)
19	4 (1.8)	22 (1.8)	26 (1.8)
20	5 (2.2)	20 (1.7)	25 (1.7)
Total	226	1206	1432

Of 1432 patients, the overall prevalence for frequency, urgency, nocturia, urge incontinence, stress incontinence, lower backache, pelvic girdle pain and feeling of bearing down were 31%, 26.7%, 18.2%, 5.4%, 7.5%, 6.9%, 56.4%, and 7.5%, respectively. Between both groups, there were differences in frequency, urgency, nocturia, and lower back pain (Table 2). Table 3 depicts the frequency, urgency, nocturia, and lower back pain in patients with retroverted gravid uterus under the gestational age of 12 weeks and above.

There were two patients with incarcerated gravid uterus with urinary retention, both of which were corrected by intervention. Both were *in vitro* fertilization pregnancies. One of them was a triplet pregnancy at the gestational age of 13. The

other subject was a 15-week twin pregnant. This gives an incidence of 1.4 in 1000 for incarcerated gravid uterus.

Table 2: Lower urinary tract symptoms in both groups.

		Retroverted group n=226 (15.7%) n (%)	Anteverted group n=1206 (84.3%) n (%)	P-value
Frequency	(-)	123 (54.4)	865 (71.7)	<0.001
	(+)	103 (45.6)	341 (28.3)	
Nocturia	(-)	170 (75.2)	1001 (83)	0.005
	(+)	56 (24.8)	205 (17)	
Urgency	(-)	145 (64.2)	905 (75)	0.001
	(+)	81 (35.8)	301 (25)	
Urge incontinence	(-)	213 (94.2)	1141 (94.6)	0.826
	(+)	13 (5.8)	65 (5.4)	
Stress incontinence	(-)	211 (93.4)	1113 (92.3)	0.575
	(+)	15 (6.6)	93 (7.7)	
UTI	(-)	206 (91.2)	1096 (90.9)	0.896
	(+)	20 (8.8)	110 (9.1)	
Lower back pain	(-)	199 (88.1)	1134 (94)	0.001
	(+)	27 (11.9)	72 (6)	
Pelvic girdle pain	(-)	94 (41.6)	530 (43.9)	0.512
	(+)	132 (58.4)	676 (56.1)	
Feeling of bearing down	(-)	203 (89.8)	1122 (93)	0.092
	(+)	23 (10.2)	84 (7)	

Table 3: Frequency, urgency, nocturia, and lower back pain in patients with retroverted gravid uterus under gestational age of 12 weeks and above.

		Gestational age of 12 weeks and below n=128 (56.6%) n (%)	Above gestational age of 12 weeks n=98 (43.4%) n (%)	P-value
Frequency	(-)	60 (46.8)	63 (64.3)	<0.001
	(+)	68 (53.2)	35 (35.7)	
Nocturia	(-)	84 (65.6)	86 (87.7)	0.552
	(+)	44 (34.4)	12 (12.3)	
Urgency	(-)	80 (62.5)	65 (66.3)	0.001
	(+)	48 (37.5)	33 (33.7)	
Lower back pain	(-)	106 (82.8)	93 (94.9)	0.006
	(+)	22 (17.2)	5 (5.1)	

## Discussion

Uterine retroversion is considered a normal variant. In our study, 226 subjects with a retroverted gravid uterus were seen out of 1432 pregnant women, submitting a total prevalence of 15.7%. This is consistent with other studies which have indicated a prevalence of up to 15% [1-3].

Lower backache/pelvic pain is a common symptom during pregnancy. It has been documented that between 20% to 90% of pregnant women have some type of pregnancy-related lumbopelvic pain [8-11]. Moreover, pregnant women often express that lumbopelvic pain affects their daily activities [12]. On the other hand, this pain can be underestimated and dismissed by healthcare providers considering the pain during pregnancy is a transient, self-limiting condition and is not an important health risk to the fetus and mother [12-13]. At 12 to 18 weeks gestation, the prevalence of low back pain/pelvic pain during pregnancy was reported as 62%, with 33% experiencing pelvic girdle pain, 11% having lower back pain, and 18% expressing both [14]. In our study, the overall prevalence of lower back and pelvic girdle pain were 6.5% (n=99) and 56.4% (n=808), respectively. Regarding lower back pain, patients in the retroverted group had a higher prevalence (11.9%) in our study.

The feeling of bearing down is one of the commonest complaints of patients with a retroverted uterus. Crichton [15] reported in his study that 56.4% of the subjects (n=808) had feelings of bearing down. In our study, 23 cases (10.2%) in the retroverted group had the complaint, and this number in the anteverted group was 84 (7%). Although it looks higher in the retroverted group, it has not reached statistical significance.

Frequency and nocturia are the commonest lower urinary tract symptoms in pregnancy [16]. Non-pregnant women

void 4-6 times a day and none or once at night. Van Brummen et al. [17] revealed that the prevalence of frequency at the 12th week of pregnancy was 74%. Francis [5] reported the prevalence of frequency for early, mid, and late pregnancies as 59%, 61%, and 81%, respectively. Parboosingh and Doig [6] reported that 66% of pregnant women had nocturia by the third trimester. Our study's overall prevalences of frequency and nocturia were 31% and 18.2%, respectively. When we evaluated the groups separately, these values were 45.6% and 24.8% in the retroverted group and 28.3% and 17% in the anteverted group, respectively. Patients in the retroverted group were more likely to encounter frequency and nocturia. Besides, within the retroverted group, subjects under 12 weeks of pregnancy had a prevalence of 53.2% and 34.4% for frequency and nocturia, respectively, whereas these values were 35.7% and 12.3% in patients above 12 weeks. We believe this disparity was caused because most of the retroversion corrects itself and goes out from the hollow of the sacrum circa 12 weeks of pregnancy.

Urgency and urge incontinence prevalence increases during pregnancy. Cutner et al. [18] reported that 62% of patients had urgency, and 18% experienced urge incontinence throughout the pregnancy. Chen et al. [19] reported that the prevalence of urge incontinence for early, middle, and late pregnancy was 31.5%, 42.9%, and 48.8%, respectively. Chaliha et al. [20] demonstrated that 22.9% of patients had urgency, and 8% experienced urge incontinence during pregnancy. Daly et al. [21] revealed that the prevalence of urge incontinence during pregnancy was 4%. The urgency and urge incontinence etiology was explained by detrusor instability and low compliance [18-22]. In our study, the overall prevalence of urgency and urge incontinence were 26.7% and 5.4%, respectively. In the retroverted group prevalence of urgency and urge, incontinence was 35.8% and 5.8%, respectively. In the anteverted group, 25% of patients had urgency, and 5.4% of subjects had urge incontinence. Prevalences of both groups for urge incontinence were similar, but patients in the retroverted group were more likely to encounter urgency. Within the retroverted group, subjects under 12 weeks of pregnancy had a prevalence of 37.5% for urgency, whereas this value was 33.7% in patients above 12 weeks. The disparity can be explained by spontaneous correction of retroversion circa 12 weeks of pregnancy.

During pregnancy, stress incontinence has been reported in up to 84% of women [23-26]. Francis [5] revealed that 16% of women had stress incontinence in the first half of the pregnancy. Stanton et al. [27] concluded that 36% of subjects experienced stress incontinence at 32 weeks of gestation. Huebner et al. [26] reported the prevalence of stress incontinence in the first half of the pregnancy as 3.6%. In our study, the overall prevalence of stress incontinence was 7.5%, and there was no difference between the groups.

We observed two patients having incarcerated retroverted gravid uterus with acute urinary retention submitting a prevalence of 1.4 in 1000 pregnancies. Incarceration of the retroverted gravid uterus is a rare condition seen mainly in the second trimester. Patients with difficulties in micturition or acute urinary retention can be associated with symptoms [28]. Generally, spontaneous correction of the retroversion occurs between 12 and 16 weeks, but in 1.4% of subjects, this fails, and

the uterus is trapped in the hollow of the sacrum [29]. The cervix is displaced anteriorly when the retroverted uterus becomes incarcerated in the pelvic cavity. As a result, complete urethral obstruction might be seen with acute urinary retention [29]. The condition's prevalence has been reported as 1 in 3000 pregnancies [30]. Our study's higher prevalence of incarcerated gravid uterus may be because multiple pregnancies *after in vitro* fertilization procedures have risen in the last decades. Both cases were conceived by *in vitro* fertilization and had multiple pregnancies. Symptoms of frequency, nocturia, and urgency were present in both patients before the urinary retention occurred. We believe that most of the cases are not reported in the literature.

### Limitations

The first limitation of our article is the study design since it is retrospective. Second, diagnoses of stress incontinence and urge incontinence were solely based on the signs and symptoms, not confirmed by urodynamics.

### Conclusion

In conclusion, patients with a retroverted uterus are more likely to experience the symptoms of lower back pain, frequency, nocturia, and urgency in the first half of pregnancy. Especially if they persist after the twelfth week of pregnancy, one should confirm the uterine position with physical and imaging examinations for early diagnosis of uterine incarceration. We believe uterine position and related symptoms during pregnancy are underestimated, underdiagnosed and underreported. We suggest that pregnant women having a retroverted uterus in the first trimester of pregnancy should have repeat pelvic examinations in the second trimester. We also recommend physicians give special attention to lower urinary tract symptoms in pregnancy and examine the uterine position.

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