

The Potential Role of Uterine Retroversion in Pelvic Pain Symptoms and Caesarean Delivery

Pelvik Ağrı Semptomlarında ve Sezaryen Doğumunda Uterin Retroversiyonunun Potansiyel Rolü

Meral Tuğba Acar Çimşir^{1*}, Muhammet Serhat Yıldız²

1.Alanya Private Şifa Medical Center, Department of Obstetrics and Gynecology, Alanya-Antalya, Turkey.

2.Alanya Private Anatolia Hospital, Department of Obstetrics and Gynecology, Alanya-Antalya, Turkey.

ABSTRACT

Aim: Uterine Retroversion is a common status in the women population and assumed to be related with pelvic pain symptoms. The aim of this study is to investigate whether uterine retroversion is associated with pelvic pain symptoms and is a reason for cesarean delivery.

Methods: One hundred thirty-three premenopausal women admitted in a Tertiary Education and Research Hospital, Department of Gynecology unit for pregestational counseling were evaluated for pelvic pain symptoms with a self-administrated questionnaire. Uterine position was assessed by pelvic examination and transvaginal ultrasound. Sixty-one women had a retroverted uterus (group1), and seventy-two had an anteverted or intermediate uterus (group2). Dyspareunia, dysmenorrhea, weight, Body Mass Index (BMI), cyclic pain, ovulation pain, premenstrual pain and mode of delivery were compared between the Retroverted group and the Anteverted or intermediate group. After successful conception and pregnancy survey, mode of delivery was also compared.

Results: Dyspareunia, dysmenorrhea, weight, BMI, cyclic pain, ovulation pain, premenstrual pain, patients' sexual activities restriction due to dyspareunia, patients medical treatment requirement for dysmenorrhea, and mode of delivery was statistically significant between two groups. ($p < 0.05$). However, PMS (premenstrual syndrome), height, gravid and parity were similar. ($p > 0.05$)

Conclusions: Uterine retroversion is associated with a higher prevalence of cesarean rate, pelvic pain and visual analogue scale for dyspareunia and dysmenorrhea in a population of unselected women.

Keywords: Cesarean, Dysmenorrhea, Dyspareunia, Uterine retroversio

ÖZ

Amaç: Uterus Retroversiyonu kadın popülasyonunda yaygın bir durumdur ve pelvik ağrı semptomları ile ilişkili olduğu varsayılmaktadır. Bu çalışmanın amacı, uterus retroversiyonunun pelvik ağrı semptomları ile ilişkili olup olmadığını ve sezaryen doğum nedeni olup olmadığını araştırmaktır.

Yöntemler: Üçüncü Basamak Eğitim ve Araştırma Hastanesi Kadın Hastalıkları Kliniği'ne pregestasyonel danışmanlık için başvuran 103 premenopozal kadın, kendi kendine uygulanan anket formu ile pelvik ağrı semptomları açısından değerlendirildi. Uterus pozisyonu pelvik muayene ve transvajinal ultrason ile değerlendirildi. Altmış bir kadında uterusu retroverted (grup 1) ve yetmiş ikisinde ise ileri dönük veya orta uterus (grup 2) vardı. Retroverted grup ile Anteverted veya intermediate grup arasında disparoni, dismenore, ağırlık, Vücut Kitle İndeksi (BMI), döngüsel ağrı, yumurtlama ağrısı, adet öncesi ağrı ve doğum şekli karşılaştırıldı. Başarılı bir gebelik ve gebelik araştırmasından sonra, doğum şekli de karşılaştırıldı.

Bulgular: Disparoni, dismenore, kilo, VKİ, döngüsel ağrı, yumurtlama ağrısı, premenstrüel ağrı, disparoni nedeniyle hastaların cinsel aktivitelerinin kısıtlanması, dismenore için hastaların medikal tedavi gereksinimi ve doğum şekli iki grup arasında istatistiksel olarak anlamlıydı. ($p < 0.05$). Bununla birlikte, PMS (adet öncesi sendrom), boy, ağırlık ve parite benzerdi. ($p > 0.05$)

Sonuçlar: Uterin retroversiyonu, seçilmemiş kadınlardan oluşan bir popülasyonda daha yüksek sezaryen oranı prevalansı, pelvik ağrı ve disparoni ve dismenore için görsel analog skala ile ilişkilidir.

Anahtar Kelimeler: Sezaryen oranı, Dismenore, Disparoni, Uterin retroversiyon

Received: 20.02.2021 Accepted: 23.03.2021 Published (Online):31.12.2021

*Corresponding Author: Meral Tuğba Acar Çimşir, İanya Private Şifa Medical Center, Department of Obstetrics and Gynecology, Alanya-Antalya, Turkey, +90 242 522 01 23, dr.tugbaacar@gmail.com

ORCID: 0000-0002-9738-3233

To cited: Acar Çimşir MT, Yıldız MS. The Potential Role of Uterine Retroversion in Pelvic Pain Symptoms and Caesarean Delivery. Acta Med. Alanya 2021;5(3):239-243 doi:10.30565/medalanya.883872

INTRODUCTION

Uterine retroversion affects approximately 20% of all women [1]. In uterine anteversion, the uterus is tilted forward at the cervix. In contrast, in a retroverted uterus, the uterus is tilted backward at the cervix [1]. Several recent studies reported that uterine retroversion was responsible for pelvic-related pain, including dyspareunia and dysmenorrhoea, with dyspareunia and dysmenorrhoea reported in 90% and 40%, respectively, of uterine retroversion cases [2–4]. Some studies reported that in women with a retroverted uterus, surgical correction of the uterine axis to a neutral position provided symptom relief [3, 5]. Pelvic pain associated with uterine retroversion led to increased use of analgesic drugs and a decrease in quality of life.

The aim of this study was to investigate whether uterine retroversion was associated with pelvic pain and increased caesarean delivery rates. Based on the findings of the present study, surgery to correct the position of the uterus and follow-up of pregnant women with uterine retroversion are recommended to prevent possible complications associated with a retroverted uterus.

METHODS

This single-centre study was conducted between June 2019 and October 2020. One hundred and thirty-three premenopausal women who visited the Department of Obstetrics and Gynaecology of a tertiary education and research hospital for pregestational counselling were included in the study. The study was approved by the local ethics committee of Alaaddin Keykubat University (Approval no.: 24-3, 09.10.2020). Signed informed consent was obtained from all the volunteers. The study protocols were designed in accordance with the principles of the Helsinki Declaration, and they adhered to local guidelines on good clinical practice.

The inclusion criteria included pelvic pain in the last 6 months, sexually active and a regular menstrual cycle in the last year. The exclusion criteria were indications for pelvic surgery, a history of pelvic surgeries or caesarean sections, endometriosis, current use of hormonal contraceptives, a fixed uterus or pelvic masses.

All the participants completed a questionnaire, which included questions on pain during the menstrual cycle, including premenstrual pain and dysmenorrhoea, and dyspareunia during sexual activity. The participants were asked whether dysmenorrhoea required them to take pain relief medication and whether dyspareunia restricted sexual activity. Demographic characteristics (age and body mass index [BMI]), were recorded, as well as information on gravidity, parity and infertility. The intensity of pain symptoms was evaluated using a visual analogue scale (VAS).

To determine the position of the uterus and diagnose uterine retroversion, all the participants underwent a pelvic examination and transvaginal ultrasound. Two physicians performed all the examinations. Of the 133 participants included in the study, 61 women had a retroverted uterus, and 72 women had an anteverted uterus (control group). All 133 women had successful pregnancies. The mode of delivery was recorded. (After completion of the records, the patients were divided into two groups: a retroverted group (group 1, n: 61) and an anteverted group (group 2, n: 72.) The recorded parameters in the two groups were then compared.

Statistical Analysis

Data analysis was performed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY). The Kolmogorov–Smirnov test was used to determine the normality of the data distribution. Categorical variables were expressed as percentages (%) and counts (n). Continuous values were given as mean \pm SD. The continuous variables were analysed using an independent T-test, and a chi-square test was used to determine associations between the categorical variables. A p value of < 0.05 was considered statistically significant.

RESULTS

Of 153 premenopausal women who visited the department for pregestational counselling, twenty women were excluded for the following reasons: endometriosis (n = 9), a history of pelvic surgery (n = 3), a fixed uterus (n = 2) and pelvic or adnexal masses (n = 6). Thus, the final study group included 133 women.

There was a statistically significant difference between the two groups in the incidence of dyspareunia and dysmenorrhoea, BMI, recurrent pain, ovulation-related pain, premenstrual pain, restriction of sexual activity due to dyspareunia, analgesic drug use for dysmenorrhoea, and mode of delivery ($p < 0.05$). There was no significant difference between the two groups in terms of premenstrual syndrome, heights, gravidity or parity ($p > 0.05$) (Table 1). The results of the independent T-test revealed significantly higher weights and BMI among the women with a retroverted uterus as compared with those of the women with an anteverted uterus. According to the VAS scores, the frequency and severity of dyspareunia were significantly higher among women with a retroverted uterus than among those with an anteverted uterus ($p < 0.05$).

The rate of cyclic pain among the retroverted uterus group (82%) was statistically higher than that among the anteverted uterus group (30.6%) ($p < 0.005$). The incidence of ovulation-related pain in the retroverted uterus group was statistically lower (3.3%) than that in the anteverted uterus group (22.2%), ($p < 0.005$). The incidence of premenstrual pain in the retroverted uterus group was statistically lower than that in the anteverted uterus group (3.3% vs. 36.1%). The incidence of analgesic drug use for dysmenorrhoea was statistically higher in the retroverted uterus group (82%) than in the anteverted uterus group (5.6%), ($p < 0.005$). In the retroverted uterus group, dyspareunia restricted sexual activity at a higher rate (83.6%) than in the anteverted uterus group (4.2%), ($p < 0.005$). There was no association between uterine retroversion and premenstrual syndrome, height, gravidity and parity ($p > 0.005$).

In the retroverted uterus group, 70.8% of women had an emergency caesarean section, whereas only 31% of women in the anteverted group had an emergency caesarean section. There was no statistically significant difference between the rates of patients who did not give birth in the two groups.

DISCUSSION

A retroverted uterus is diagnosed as a uterus with an angle between the axis of the uterine body and the vagina, with the body directed posteriorly

Table 1: Descriptive Statistics and Analysis Results in Comparing Variables by Patient Groups

		Retroverted Uterus (N=61)	Anteverted or Intermediary Uterus (N=72)	p value
Dyspareunia VAS score	0	3 (%4,9)	31 (%43,1)	b0,000*
	1-3	5 (%8,2)	23 (%31,9)	
	4-7	26 (%42,6)	17 (%23,6)	
	8-10	27 (%44,3)	1 (%1,4)	
Dysmenorrhea VAS score	0	2 (%3,3)	31 (%43,1)	b0,000*
	1-3	17 (%27,9)	23 (%31,9)	
	4-7	23 (%37,7)	18 (%25)	
	8-10	19 (%31,1)	0 (%0)	
PMS	+	26 (%42,6)	37 (%51,4)	b0,313
	-	35 (%57,4)	35 (%48,6)	
Height (Cm)		162,0 ± 7,1	162,8 ± 6,3	a0,493
Weight (kg)		74,3 ± 10,4	69,7 ± 10,9	a0,015*
Body mass index kg/cm2		28,4 ± 3,7	26,3 ± 4,0	a0,002*
Gravid	1	12 (%19,7)	18 (%25)	b0,761
	2	25 (%41)	29 (%40,3)	
	3	15 (%24,6)	13 (%18,1)	
	4	9 (%14,8)	12 (%16,7)	
Parity	1	14 (%23)	25 (%34,7)	b0,271
	2	27 (%44,3)	30 (%41,7)	
	3	20 (%32,8)	17 (%23,6)	
Cyclic pain	-	11 (%18)	50 (%69,4)	b0,000*
	+	50 (%82)	22 (%30,6)	
Ovulation pain	-	59 (%96,7)	56 (%77,8)	b0,001*
	+	2 (%3,3)	16 (%22,2)	
Premenstrual pain	-	59 (%96,7)	46 (%63,9)	b0,000*
	+	2 (%3,3)	26 (%36,1)	
Dysmenorrhea requires medical treatment	-	11 (%18)	68 (%94,4)	b0,000*
	+	50 (%82)	4 (%5,6)	
Dyspareunia restricts sexual activity	-	10 (%16,4)	69 (%95,8)	b0,000*
	+	51 (%83,6)	3 (%4,2)	
Delivery type	No delivery	8 (%16,7)	10 (%13,9)	b0,000*
	Normal vaginal delivery	6 (%12,5)	50 (%69,4)	
	Primary cesarean delivery	34 (%70,8)	12 (%16,7)	

* $p < 0,05$; a Independent Group t Test; b Ki-Square Test

towards the hollow of the sacrum [6]. In women who present with pelvic pain, an ultrasound scan is generally performed to help determine the cause. To diagnose a retroverted uterus, the

bladder must be empty at the time of scanning. [6, 7]. In the present study, the incidence and severity of dyspareunia and dysmenorrhoea were significantly associated with uterine retroversion in premenopausal women. A similar study to ours reported a comparable rate of dyspareunia and pelvic pain symptoms with 581 participant [18]. No previous studies have examined the effects of uterine retroversion on delivery modes (i.e. vaginal vs. caesarean deliveries). According to the results of our study, uterine retroversion is a common reason for a caesarean section.

Several recent studies reported that uterine retroversion may lead to uterine incarceration, which resulted in severe and progressive complications, such as recurrent urinary tract infections, acute urinary retention, anterior uterine wall thinning due to uterine sacculation, bladder rupture, preterm labour, premature rupture of foetal membranes, spontaneous abortions and uterine rupture during labour. Uterine rupture in cases of uterine incarceration was attributed to failure of the cervix to dilate during labour [19]. If it is not diagnosed, it can lead to intrauterine growth retardation and oligohydramnios. In such cases, an emergency caesarean section, with bladder, cervical, vaginal, and posterior or anterior uterine wall incisions may be required, all of which have the potential for renal failure and sepsis [20]. In a pregnant patient with an incarcerated uterus, uterus continues to grow/enlarge between the subpromontory sacrum and pubis in the pelvic cavity [8]. Potential causes of an incarcerated gravid uterus, which is diagnosed in approximately 1 in every 3,000 pregnancies, include uterine anomalies, fibroids, pelvic adhesions, endometriosis or a deep sacral cavity with a prominent promontory [8]. In most cases, a retroverted uterus undergoes spontaneous correction to an anteverted uterus by the first trimester [9]. An incarcerated gravid uterus is generally diagnosed by a pelvic examination and confirmed by transvaginal ultrasound on an empty bladder [6, 7]. A caesarean section should be planned if uterine reduction cannot be performed [8, 10–14]. Preoperative diagnosis and treatment of incarceration are essential to avoid intraoperative complications and trauma to the bladder, vagina and cervix during labour and to avoid the need for a transvaginal caesarean

section and a hysterectomy [10, 14–17].

In the present study, there was an increased rate of caesarean sections in the retroverted uterus group. The most frequent indication for a caesarean section in the retroverted uterus group was prolonged labour, whereas it was cephalopelvic disproportion in the anteverted uterus group. In cases of uterine retroversion, acceleration of uterine contractions during vaginal labour is attributed to a decrease in blood flow due to the position of the uterus.

The mechanisms by which uterine retroversion cause pelvic pain are unclear. According to some research, it may be due to the penis colliding with the corpus of the uterus during intercourse or retroversion forcing the cervix to move anteriorly during intercourse instead of as a unit with the uterosacral ligaments, with resulting stretching of the ligaments [21]. According to other research, pelvic venous congestion in uterine retroversion may contribute to pain and venous insufficiency during labour and lead to an emergency caesarean section.

Recent research showed that an anteverted retroflexed uterus was extremely rare and that it was a consequence of caesarean delivery [22]. The authors reported that the retroverted uterus turned into anteversion after a caesarean section but remained in the retroflexion due to the adhesion tension in the caesarean scar in the lower segment of the uterus [22].

Our study had a number of limitations. One limitation was that we did not investigate the relation between uterine retroversion and pregnancy outcomes, such as birth weights and perinatal mortality. To the best of our knowledge, no studies have investigated the relationship between uterine retroversion and mode of delivery previously. Another limitation was that ultrasound cannot detect superficial endometriosis. The prevalence of superficial endometriosis as a confounding factor may be as high as 50% in unselected populations [23, 24]. Undetected intra-abdominal lesions due to endometriosis may also have accounted for some cases of uterine retroversion and retrograde menstruation. Nevertheless, the present study may contribute to national data and/or the systematic reviews and meta-analyses [25]

and which will be done together with other studies originating from our country.

CONCLUSIONS

To the best of our knowledge, this is the first study specifically designed to evaluate the effect of uterine retroversion on pelvic pain and delivery type in a general population of women admitted for pregestational counselling. In this study, uterine retroversion was a common cause of pelvic pain and primary caesarean sections. Further studies are needed to confirm these findings. Nevertheless, the data in the present study shed light on the association of the anatomical status of the uterus with pelvic pain and delivery type.

Conflict of Interest: The author declares no conflict of interest related to this article.

Funding sources: The author declares that this study has received no financial support

Ethics Committee Approval: Alanya Alaaddin keykubat University, School of Medicine Clinical Ethics Board – 09/10/2020 / 24-3

Peer-review: Externally and internally peer reviewed.

REFERENCES

- Cagnacci A, Grandi G, Cannolatta M, Xholli A, Piacenti I, Volpe A. Intensity of menstrual pain and estimated angle of uterine flexion. *Acta Obstet Gynecol Scand.* 2014;93(1):58-63. doi: 10.1111/aogs.12266.
- Fauconnier A, Dubuisson JB, Foulot H, Deyrolles C, Sarrot F, Laveyssière MN, et al. Mobile uterine retroversion is associated with dyspareunia and dysmenorrhea in an unselected population of women. *Eur J Obstet Gynecol Reprod Biol.* 2006;127(2):252-6. doi:10.1016/j.ejogrb.2005.11.026.
- Ott J, Nouri K, Demmel M, Zafraani S, Greilberger U, Huber JC, et al. Fourteen-year experience with laparoscopic ventrosuspension in patients with retroverted and retroflexed uterus and pelvic pain syndromes. *J Minim Invasive Gynecol.* 2010;17(6):749-53. doi:10.1016/j.jmig.2010.07.015.
- Atthill L. On the Relation of Antelexion of the Uterus to Dysmenorrhoea. *Br Med J.* 1881;2(1095):1010-1. doi: 10.1136/bmj.2.1095.1010-a.
- Moawad NS. Laparoscopic Uterine Ventrosuspension. *J Minim Invasive Gynecol.* 2018. doi:10.1016/j.jmig.2018.09.633.
- Haylen BT, McNally G, Ramsay P, Birrell W, Logan V. A standardised ultrasonic diagnosis and an accurate prevalence for the retroverted uterus in general gynaecology patients. *Aust N Z J Obstet Gynaecol.* 2007;47(4):326-8. doi: 10.1111/j.1479-828X.2007.00745.x.
- Freimanis MG, Jones AF. Transvaginal ultrasonography. *Radiol Clin North Am.* 1992;30(5):955-76. PMID: 1518939
- Gottschalk EM, Siedentopf JP, Schoenborn I, Gartenschlaeger S, Dudenhausen JW, Henrich W. Prenatal sonographic and MRI findings in a pregnancy complicated by uterine sacculation: case report and review of the literature. *Ultrasound Obstet Gynecol.* 2008;32(4):582-6. doi: 10.1002/uog.6121.
- Takami M, Hasegawa Y, Seki K, Hirahara F, Aoki S. Spontaneous reduction of an incarcerated gravid uterus in the third trimester. *Clin Case Rep.* 2016;4(6):605-10. doi: 10.1002/ccr3.577.
- Singh MN, Payappagoudar J, Lo J, Prashar S. Incarcerated retroverted uterus in the third trimester complicated by postpartum pulmonary embolism. *Obstet Gynecol.* 2007;109(2 Pt2):498-501. doi: 10.1097/01.AOG.0000218695.71256.cf.
- Barton-Smith P, Kent A. Asymptomatic incarcerated retroverted uterus with anterior sacculation at term. *Int J Gynaecol Obstet.* 2007;96(2):128. doi: 10.1016/j.ijgo.2006.09.010.
- Chauleur C, Vulliez L, Seffert P. Acute urine retention in early pregnancy resulting from fibroid incarceration: proposition for management. *Fertil Steril.* 2008;90(4):1198.e7-10. doi: 10.1016/j.fertnstert.2007.10.008.
- Charova J, Yunus D, Sarkar PK. Incarcerated retroverted gravid uterus presenting as placenta praevia. *J Obstet Gynaecol.* 2008;28(5):537-9. doi: 10.1080/14756360802236682.
- van der Tuuk K, Krenning RA, Krenning G, Monincx WM. Recurrent incarceration of the retroverted gravid uterus at term - two times transvaginal caesarean section: a case report. *J Med Case Rep.* 2009;3:103. doi: 10.1186/1752-1947-3-103.
- CME Review Article. *Pediatr Emerg Care.* 2017;33(12):792-3. doi: 10.1097/01.pec.0000526609.89886.37.
- Uma R, Oláh KS. Transvaginal caesarean hysterectomy: an unusual complication of a fibroid gravid uterus. *BJOG.* 2002;109(10):1192-4. PMID: 12387479
- Haylen BT. The retroverted uterus: ignored to date but core to prolapse. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006;17(6):555-8. doi: 10.1007/s00192-005-0051-0.
- Jamieson, Denise J.; Steege, John F. The prevalence of dysmenorrhea, dyspareunia, pelvic pain, and irritable bowel syndrome in primary care practices. *Obstet Gynecol.* 1996;87(1):55-8. doi:10.1016/0029-7844(95)00360-6
- Wang L, Wang J, Huang L. Incarceration of the retroverted uterus in the early second trimester performed by hysterotomy delivery. *Arch Gynecol Obstet.* 2012;286(1):267-9. doi:10.1007/s00404-012-2223-8
- Dierickx I, Meylaerts LJ, Van Holsbeke CD, de Jonge ET, Martens IF, Mesens T, et al. Incarceration of the gravid uterus: diagnosis and preoperative evaluation by magnetic resonance imaging. *Eur J Obstet Gynecol Reprod Biol.* 2014;179:191-7. doi: 10.1016/j.ejogrb.2014.05.037.
- Carter JE. Surgical treatment for chronic pelvic pain. *JLSLS.* 1998;2(2):129-39. PMID: 9876726.
- Sanders RC, Parsons AK. Anteverted retroflexed uterus: A common consequence of cesarean delivery. *AJR Am J Roentgenol.* 2014;203(1):W117-24. doi:10.2214/AJR.12.10403
- Balash J, Creus M, Fábregues F, Carmona F, Ordi J, Martínez-Román S, et al. Visible and non-visible endometriosis at laparoscopy in fertile and infertile women and in patients with chronic pelvic pain: a prospective study. *Hum Reprod.* 1996;11(2):387-91. doi: 10.1093/humrep/11.2.387.
- Matorras R, Rodríguez F, Pijoan JI, Soto E, Pérez C, Ramón O et al. Are there any clinical signs and symptoms that are related to endometriosis in infertile women? *Am J Obstet Gynecol.* 1996;174(2):620-3. doi: 10.1016/s0002-9378(96)70438-6.
- Ahmet A. [Systematic Reviews and Meta-Analyses]. *Acta Med. Alanya* 2018;2(2):62-63. DOI: 10.30565/medalanya.439541

Author / ORCID	Authorship Contribution
Meral Tuğba Acar Çimşir 0000-0002-9738-3233	Materials and/or Practices, Data collection and/or Processing, Literature Review and/or Search, Manuscript Writing and/or Final approval, Supervision and/or Critical Review.
Muhammet Serhat Yıldız 0000-0002-9321-5320	Concept and/or Design, Materials and/or Practices, Data collection and/or Processing, Analysis and/or Interpretation, Supervision and/or Critical Review.