The Correlation of Adenomyosis with Benign Endometrial Lesions in Hysterectomy Samples

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ABSTRACT

Background & Objective: Adenomyosis is a prevalent gynecological disorder among women with no specified causes. It is characterized by nonspecific symptoms, and can present itself as abnormal uterine bleeding, abdominal pain, menstrual disorders, and the like. Its diagnosis is made based on the pathologic histological examination of hysterectomized samples. This study aimed to evaluate the correlation of adenomyosis with other benign endometrial disorders in hysterectomized samples.

Materials & Methods: In this paper a total of 413 patients who referred to Rouhani Hospital of Babol, form 2012 to 2017, and underwent a hysterectomy surgery with pathological reports confirming the diagnosis of adenomyosis, were studied. After reviewing the medical records, the patients' data, including their age, weight, number of deliveries, place of residence, and main complaints at the time of referral as well as benign endometrial pathologies correlated with adenomyosis, were examined. Finally, the obtained data were analyzed using statistical tests.

Results: The prevalence of adenomyosis in this study was 21.7%. The patients' most common complaints were abnormal uterine bleeding (86.4%), dysmenorrhea (39.2%), abdominal pain (31.2%), dyspareunia (21.1%), mass outflow (15%), and pelvic pain (9.4%). In the current study, the benign pathologies correlated with adenomyosis were leiomyoma (52.5%), uterine polyp (11.9%), adenomyoma (5.1%), and hyperplasia (0.5%).

Conclusion: In the present study, the prevalence of adenomyosis was high and abnormal uterine bleeding was the patients' most prevalent complaint. Moreover, leiomyoma had the highest correlation with adenomyosis.

Keywords: Adenomyosis, Endomyometrium, Hysterectomy, Leiomyoma

Introduction

The uterus is a complex reproductive organ divided into endometrium and myometrium based on histology and anatomy **(1)**.

Adenomyosis is a prevalent gynecological disorder with unknown causes, characterized by the presence of stroma and uterine endometrial layer glands within the myometrium with an increase in the number of myometrial smooth muscles **(2,3)**. This disorder replaces at least 2.5 mm of the endometrium-myometrium junction, presenting in both focal and diffuse forms, and most often affects the posterior wall of the uterus rather than its anterior wall **(4)**. The cause of this disorder is still unknown and it appears to be influenced by several factors **(5)**.

Adenomyosis is relatively common, affects about 1% of female patients, and mainly develops in cases who have had multiple deliveries and are in their 4th and 5th decades of their lives **(2)**. However, this pathology also occurs rarely in nulliparous women **(6)**. The clinical manifestations of adenomyosis include diffuse enlargement of the uterus with increased bleeding, menstrual pain, and pain during sexual intercourse **(2,4)**. Due to its nonspecific symptoms, the clinical diagnosis of this disorder is sometimes difficult to make **(7)**. The final diagnosis of adenomyosis is made based on the histological evaluation done after a hysterectomy **(8)**.

In a study carried out by Shretha et al., the results indicated that the symptoms of adenomyosis were bleeding (91.2%), menstrual pain (84.2%), and abdominal pain (84.2%) at reproductive age. Furthermore, adenomyosis was correlated with leiomyoma (16.3%) **(9)**. Ghazala Rizvi et al. showed that 45.56% of women who were diagnosed with

adenomyosis in premenopausal age experienced abnormal uterine bleeding **(10)**.

In 2013, in his study, Pervez SN demonstrated that out of 861 cases that underwent a hysterectomy, 296 cases were diagnosed with adenomyosis and most of these cases were correlated with leiomyoma **(11)**.

In a study conducted by Maryam Dehghani Mobarakeh *et al.*, in 2012 the overall prevalence of adenomyosis was 49% and the patients' mean age was 46.9±7 years, with a high prevalence in the age range of 30 to 60 years **(12)**.

Harada T. *et al.* figured out that adenomyosis increased the rate of infertility among women who were older than 30-40 years at the time of their first pregnancy **(13)**.

Attitudes toward the value of sexual and psychological reproductive behaviors have changed in Western countries in recent decades **(14)**. Recently, evidence has introduced adenomyosis as an important factor in infertility, suggesting that adenomyosis in premenopausal age (in correlation with endometriosis) may be a contributing factor to infertility **(15)**.

Given the high prevalence of this disorder in different age groups of women and its correlation with other disorders and considering the role of adenomyosis in infertility or fertility among women, this study aimed to investigate the prevalence and distribution of adenomyosis in different groups in terms of age, weight, and number of deliveries, and evaluate its correlation with other benign endometrial pathologies.

Materials and Methods

This cross-sectional study was performed over six years from 2012 to 2017, after being approved by the Ethics Committee of Babol University of Medical Sciences, the study was registered with the following ethics code, i.e., MUBABOL.HRI.REC.1396.220. The inclusion criteria of this study consisted of all hysterectomized patients diagnosed with adenomyosis at Ayatollah Rouhani Hospital in Babol, Iran. The exclusion criteria composed of incomplete data and study-related medical records of patients with adenomyosis.

Initially, the number of hysterectomies performed during the mentioned period was obtained by searching

for the information center of the pathology unit. Then, by searching for the word *adenomyosis*, the total number of patients with this disorder was determined. Study-related medical records were evaluated in which the required information, including the patients' complaints at the time of referral as well as their demographic information, such as their age, weight, number of deliveries, and place of residence, was recorded. The collected data were analyzed by applying quantitative and qualitative statistical tests via SPSS 18 (SPSS Inc., Chicago, IL., USA). These data were described by presenting frequency tables and related charts. Results were compared using descriptive statistics and the Chi-square test. A P-value<0.5 was considered as statistically significant.

Results

In this study, 1900 patients who underwent a hysterectomy were studied, among whom 413 patients were diagnosed with adenomyosis. The patients' age ranged from 28 to 90 years, with a mean age of 48.60 years. The patients' weight ranged from 48 to 137 kg, with a mean weight of 76.27 kg and the number of deliveries ranged from 0 to 13 deliveries, with a mean of 3.31 deliveries.

The patients' most common clinical symptoms were examined and classified, among which abnormal uterine bleeding (86.4%) was the most prevalent symptom (Table 1).

The frequency of benign endometrial pathologies correlated with adenomyosis was evaluated. As can be seen, leiomyoma, with a frequency percentage of 52.5%, had the highest correlation with adenomyosis. After that, polyp (with a frequency percentage of 11.9%), adenomyoma (with a frequency percentage of 5.1%) and hyperplasia (which was present in 2 cases and had a frequency percentage of 0.5%) had correlations with adenomyosis (Table 2).

Among the pathologies correlated with the number of deliveries studied separately, none of the pathologies had significant correlations with the number of deliveries (Table 3).

Examining the associations between the types of pathologies correlated with the patients' age showed that leiomyomas ($P<0.001$) and uterine polyps ($P=0.013$) were significantly correlated with age (Table 4).

Table 1. Common complaints of the patients with a pathology of adenomyosis in hysterectomized samples

Clinical symptoms	Number	Frequency	Frequency percentage
Abnormal uterine bleeding	413	357	86.4
Dysmenorrhea	413	162	39.2
Abdominal pain	413	129	31.2
Dyspareunia	413	87	21.1
Mass outflow (prolapse)	413	62	15
Heavy pelvic floor	413	39	9.4

Table 2. Examining the correlation of benign endometrial pathologies with adenomyosis in the hysterectomized patients

Pathology	Number	Correlation	Frequency	Frequency percentage
Leiomyoma	413	Yes	217	52.5
		No	196	47.5
Adenomyoma	413	Yes	21	5.1
		No	392	94.9
Polyp	413	Yes	49	11.9
		No	364	88.1
Hyperplasia	413	Yes	2	0.5
		No	411	99.5

Table 3. Comparing the frequencies and frequency percentages of the pathologies correlated with the number of delivery

Number of delivery Pathology		0-1	2-3-4	More than 4	Sig
		Frequency (percent)	Frequency (percent)	Frequency (percent)	
Leiomyoma	Yes	20 (60.6)	169 (54.5)	28 (40.0)	0.056
	No	13 (39.4)	141 (45.5)	42 (60.0)	
Adenomyoma	Yes	3 (9.1)	15 (4.8)	3 (4.3)	0.541
	No	30 (90.9)	295 (95.2)	67 (95.7)	
Polyp	Yes	3 (9.1)	32 (10.3)	14 (20.0)	0.068
	No	30 (90.9)	278 (89.7)	56 (80.0)	
Hyperplasia	Yes	0 (0.0)	1 (0.3)	1 (1.4)	0.444
	No	33 (100.0)	309 (99.7)	69 (98.6)	

Table 4. Comparing the frequencies and frequency percentages of the pathologies correlated with the patients' age

Number of delivery Pathology		Younger than 50	50-60	Older than 60	Sig
		Frequency (percent)	Frequency (percent)	Frequency (percent)	
Leiomyoma	Yes	145 (54.5)	66 (58.4)	6 (17.6)	0.000
	No	121 (45.5)	47 (41.6)	28 (82.4)	
Adenomyoma	Yes	12 (4.5)	9 (8.0)	0 (0.0)	0.139
	No	254 (95.5)	104 (92.0)	34 (100.0)	
Polyp	Yes	25 (9.4)	15 (13.3)	9 (26.5)	0.013
	No	241 (90.6)	98 (86.7)	25 (73.5)	
Hyperplasia	Yes	1 (0.4)	1 (0.9)	0 (0.0)	0.738
	No	265 (99.6)	112 (99.1)	34 (100.0)	

Discussion

Based on the results 1900 hysterectomized patients examined over 6 years from 2012 to 2017 of this study, 413 patients had adenomyosis. Therefore, the prevalence of this pathology was 21.7% in this study however the prevalence has been reported from 8 to 85% in various hysterectomy samples **(16)**.

In a study carried out by Parazzinia *et al.* in 2009, on 820 hysterectomy samples taken from 18 centers in different parts of Italy over a year, 231 samples had adenomyosis, with a prevalence of 28.2%. Moreover, the mentioned study confirmed that women who had multiple deliveries were more likely to develop adenomyosis and this is consistent with the findings of

the current study **(17)**. Yenril O *et al.* performed a study on 298 hysterectomized samples over 18 months, of which 103 samples had adenomyosis, with a prevalence rate of 36.2% **(18)**. In a two-year study conducted on 213 hysterectomized patients, Y.L. Sun *et al.* reported 85 cases of adenomyosis with a prevalence of 39.9%.

This prevalence decreases at the onset of menopause and the later ages. This reduction can be due to the onset of menopause and estrogen removal. The current study showed that adenomyosis was more prevalent among women who had multiple deliveries (2, 3 or 4 deliveries) and were considered as multiparous compared to women who had no deliveries or one delivery.

According to the results of this study, the patients' mean age was 48.60 years and they were divided into three groups. Most of the patients were younger than 50 years old (64.4%).

Parazzinia *et al.* also showed that the mean age of hysterectomized patients with adenomyosis was 51.2 years. This mean age was close to that of the present study. Additionally, this study found that when women aged 50 to 59 years old underwent a hysterectomy, the prevalence of adenomyosis increased; however, the prevalence of adenomyosis decreased after this age **(17)**. In 2012, Shrestha divided the hysterectomized patients into two groups, i.e., the patients with and without adenomyosis, and found no associations between adenomyosis and age **(19)**. The results of these studies are in line with the results of the present study. Having this in mind, it can be stated that the prevalence of adenomyosis increases until menopause and with having at least one delivery **(20)**. The more the number of deliveries, the higher the prevalence of adenomyosis is. This reflects the theory of the replacement of endometrial basal layers in the myometrium **(21)**.

Abnormal uterine bleeding, dysmenorrhea (menstrual pain), and chronic abdominal pain are the patients' three most common symptoms, among which abnormal bleeding with a high prevalence of 86.4% was mentioned by most of the patients. A study was performed by Nilima G in 2015 on 100 patients who complained about menorrhagia and underwent a hysterectomy identified adenomyosis and leiomyoma as two common causes **(22)**. According to the results, 162 patients (39.2%) complained about menstrual pain. In the study conducted by F. Andrei Taran *et al.*, which compared the complaints of patients with adenomyosis and leiomyoma, the results indicated that 53% of those who only had adenomyosis complained about dysmenorrhea, while about one-third of the patients (37.3%) who had leiomyomas complained about menstrual pain. Moreover, this study found that the risk of menstrual pain was reduced in patients with both disorders **(20)**. Perhaps the lower percentage of this complaint in the present study was because adenomyosis was accompanied by other disorders.

Examining the benign pathologies correlated with adenomyosis showed that leiomyoma (52.5%), uterine polyp (11.9%), adenomyoma (5.1%), and hyperplasia (0.5%) were present.

In a postoperative follow-up study carried out by Templeman *et al.* on 961 patients diagnosed with adenomyosis, 311 patients simultaneously had fibroma (32.4%). Moreover, 99 patients had prolapse (10.3%) and 19 patients had hyperplasia (2%) **(23)**. In this regard, similar to this study, leiomyoma had the highest correlation and hyperplasia had the least correlation with adenomyosis and this finding is consistent with the results obtained from the current study. On the other hand, the correlation between leiomyoma in the mentioned study was less than the results of this study (32.4% vs. 52.5%). Another study done by Bergeron *et al.* reported the correlation of leiomyoma and endometrial polyp, as two common pathologies, with adenomyosis **(24)**.

In another study carried out by Mine Genc on 945 patients who underwent a hysterectomy for different reasons and were divided into two subgroups, i.e., with and without an adenomyosis diagnosis, it was found that in the adenomyosis group (including 327 patients), 184 cases had leiomyoma and 31 patients had endometrial hyperplasia. According to the results of this study, the correlation between adenomyosis and leiomyoma was significant, whereas there was no significant relationship between adenomyosis and hyperplasia **(25)**. Hence, it can be noted that leiomyoma is a disorder that usually accompanies adenomyosis when diagnosed.

This is while a study performed by Bergholt *et al.* showed a link between adenomyosis and endometrial hyperplasia **(8)**. This relationship may be due to the common factors affecting the two pathologies, the most prominent of which is the increase in estrogen levels **(25)**.

Conclusion

The results of this study indicated that the prevalence of adenomyosis was high in hysterectomized patients. The findings demonstrated that the prevalence rate of adenomyosis increases with age until menopause; however, it declines thereafter and at older ages. Leiomyoma, among the benign endometrial pathologies, had the highest correlation with adenomyosis. It is suggested that adenomyosis be examined with ultrasound findings in future studies.

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Conflict of Interest

Authors declared no conflict of interests.

References

1. Novellas S, Chassang M, Delotte J, Toullalan O, Chevallier A, Bouaziz J, et al. MRI characteristics of the uterine junctional zone: from normal to the diagnosis of adenomyosis. American Journal of Roentgenology. 2011;196(5):1206-13. [DOI:10.2214/AJR.10.4877] [PMID]

2. Ronald Devlieger tdh, Dirk Timmerman. Uterine adenomyosis in the infertility clinic Human Reproduction Update. 2003;9(2):139-47. [DOI:10.1093/humupd/dmg010] [PMID]

3. Tamai K, Togashi K, Ito T, Morisawa N, Fujiwara T, Koyama T. MR imaging findings of adenomyosis: correlation with histopathologic features and diagnostic pitfalls. Radiographics. 2005;25(1):21-40. [DOI:10.1148/rg.251045060] [PMID]

4. Murat Ekin HC, Emine Öztürk, Cihan KayaL, event Yaşar. Genitourinary symptoms in patients with adenomyosis. International Urogynecology Journal. 2013;24(3):509-12. [DOI:10.1007/s00192-012-1903-z] [PMID]

5. Curtis KM, Hillis SD, Marchbanks PA, Peterson HB. Disruption of the endometrial-myometrial border during pregnancy as a risk factor for adenomyosis. American journal of obstetrics and gynecology. 2002;187(3):543-4. [DOI:10.1067/mob.2002.124285] [PMID]

6. Al Jama FE. Management of adenomyosis in subfertile women and pregnancy outcome. Oman medical journal. 2011;26(3):178. [DOI:10.5001/omj.2011.43] [PMID] [PMCID]

7. Bazot M, Cortez A, Darai E, Rouger J, Chopier J, Antoine J-M, et al. Ultrasonography compared with magnetic resonance imaging for the diagnosis of adenomyosis: correlation with histopathology. Human Reproduction. 2001;16(11) 2427-33. [DOI:10.1093/humrep/16.11.2427] [PMID]

8. Bergholt T, Eriksen L, Berendt N, Jacobsen M, Hertz JB. Prevalence and risk factors of adenomyosis at hysterectomy. Human Reproduction. 2001;16(11):2418-21. [DOI:10.1093/humrep/16.11.2418] [PMID]

9. A Shrestha RS, LB Sedhai, U Pandit. Adenomyosis at Hysterectomy: Prevalence, Patient Characteristics, Clinical Profile and Histopatholgical Findings. Kathmandu University Medical Journal. 2012;10(37). [DOI:10.3126/kumj.v10i1.6915] [PMID]

10. Ghazala Rizvi HP, Hema Pant,1 Sanjay Singh Chufal, and Prabhat Pant. Histopathological correlation of adenomyosis and leiomyoma in hysterectomy specimens as the cause of abnormal uterine bleeding in women in different age groups in the Kumaon region: A retroprospective study 2013 Jan-Mar.

11. Pervez SN JK. Adenomyosis among samples from hysterectomy due to abnormal uterine bleeding. Journal of Ayub Medical College. 01 Jan 2013;25(1-2):68-70. [PMCID]

12. Maryam Dehghani Mobarakeh AM, and Iran Rashidi1. Adenomyosis among samples from hysterectomy due to abnormal uterine bleeding in Ahwaz, southern Iran.

advance biomedical research. 2012 Aug 28; 1. [DOI:10.4103/2277-9175.100156] [PMID] [PMCID]

13. Tasuku Harada YMK, Apostolos Kaponis,Theocharis Nikellis,George Decavalas,Fuminori Taniguchi. The Impact of Adenomyosis on Women's Fertility. Obstet Gynecol Surv. 2016;71(9):557-68. [DOI:10.1097/OGX.0000000000000346] [PMID] [PMCID]

14. Zucchi A, Lazzeri M, Porena M, Mearini L, Costantini E. Uterus preservation in pelvic organ prolapse surgery. Nature Reviews Urology. 2010;7(11):626. [DOI:10.1038/nrurol.2010.164] [PMID]

15. Leyendecker G, Kunz G, Kissler S, Wildt L. Adenomyosis and reproduction. Best Practice & Research Clinical Obstetrics & Gynaecology. 2006;20(4):523-46. [DOI:10.1016/j.bpobgyn.2006.01.008] [PMID]

16. Hanafi M. Ultrasound diagnosis of adenomyosis, leiomyoma, or combined with histopathological correlation. J Hum Reprod Sci. 2013 Jul-Sep;6(3):189-93. [DOI:10.4103/0974-1208.121421] [PMID] [PMCID]

17. F.Parazzinia;V.Maisb;S.Cipriania;M.Busaccac;P.Venturinid. Determinants of adenomyosis in women who underwent hysterectomy for benign gynecological conditions: Results from a prospective multicentric study in Italy. European Journal of Obstetrics & Gynecology and Reproductive Biology. April 2009;143(2):103-6. [DOI:10.1016/j.ejogrb.2008.12.010] [PMID]

18. Yeniel O CT, Ulukus M , Ozbal A , Gundem G , Ozsener S , Zekioglu O , Yilmaz H Adenomyosis: prevalence, risk factors, symptoms and clinical findings. Clinical and Experimental Obstetrics & Gynecology. 01 Jan 2007; 34(3):163-7. PMID:17937092

19. Shrestha A. Risk factors for adenomyosis. J Nepal Health Res Counc. 2012;10(22):229-33.

20. Taran FA, Weaver AL, Coddington CC, Stewart EA. Characteristics indicating adenomyosis coexisting with leiomyomas: a case-control study. Human Reproduction. 2010;25(5):1177-82. [DOI:10.1093/humrep/deq034] [PMID] [PMCID]

21. Shakira Perveen St. A clinicopathological review of elective abdominal hysterectomy. Journal of Surgery Pakistan January - March 2008;13(1): 9-26.

22. Nilima G. Sawke GKS, and Hanisha Jain. Histopathology findings in patients presenting with menorrhagia: A study of 100 hysterectomy specimen. J Midlife Health. 2015 Oct-Dec;6(4):160-3. [DOI:10.4103/0976-7800.172299] [PMID] [PMCID]

23. Templeman C, Marshall SF, Ursin G, Horn-Ross PL, Clarke CA, Allen M, et al. Adenomyosis and endometriosis in the California Teachers Study. Fertility and sterility. 2008;90(2):415-24. [DOI:10.1016/j.fertnstert.2007.06.027] [PMID] [PMCID]

24. Bergeron C, Amant F, Ferenczy A. Pathology and physiopathology of adenomyosis. Best practice & research Clinical obstetrics & gynaecology. 2006;20(4):511-21. [DOI:10.1016/j.bpobgyn.2006.01.016] [PMID]

25. Genc M, Genc B, Cengiz H. Adenomyosis and accompanying gynecological pathologies. Archives of gynecology and obstetrics. 2015;291(4):877-81. [DOI:10.1007/s00404-014-3498-8] [PMID]

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