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Clinical Outcome of Hormonal Therapy in the Management of Adenomyosis among Perimenopausal Women

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Abstract

Background: Adenomyosis is an estrogen-dependent uterine disorder commonly associated with heavy menstrual bleeding, dysmenorrhea, uterine enlargement and anemia. In perimenopausal women, hormonal treatment is often preferred to preserve the uterus and avoid surgery. However, real-world evidence on treatment outcomes in this age group remains limited, particularly in Bangladeshi clinical settings. This study evaluated clinical outcomes, satisfaction and tolerability of hormonal therapy. ***Methods:*** This retrospective observational study was conducted at the Department of Obstetrics and Gynaecology, Mugda Medical College & Hospital, from June 2023 to July 2024. A total of 150 women aged 40–52 years with ultrasonography-confirmed adenomyosis received LNG-IUS, dienogest, or GnRH agonists and had a six-month follow-up. Clinical, hematological, satisfaction and adverse-effect data were extracted from records. McNemar's test was used for paired outcomes, with $p<0.05$ considered significant. ***Results:*** At six months, menorrhagia decreased from 92.0% to 4.0%, severe pelvic pain/dysmenorrhea from 78.7% to 12.0%, uteromegaly from 49.3% to 14.7% and anaemia from 69.3% to 17.3% (all $p<0.001$). Amenorrhea was achieved by 58.7% of participants, while 86.7% were satisfied or highly satisfied with treatment. Irregular spotting/breakthrough bleeding was the most frequent adverse effect (29.3%), followed by weight gain (17.3%). Overall, adverse effects were manageable. ***Conclusion:*** Hormonal therapy was associated with six-month improvement in bleeding, pain, uterine enlargement and anemia, with high treatment satisfaction and tolerable adverse effects. These findings support hormonal therapy as a uterus-conserving option for symptomatic adenomyosis in perimenopausal women.

Keywords: Adenomyosis, Perimenopausal women, Hormonal therapy, Levonorgestrel-releasing intrauterine system, Dienogest.

INTRODUCTION

Adenomyosis is a benign gynecological condition characterized by the ectopic presence of endometrial glands and stroma within the myometrium, resulting in reactive myometrial hypertrophy and an enlarged, tender uterus. Its reported prevalence varies widely across populations, ranging from as low as 1% in the general population to over 40% among women presenting with gynecological symptoms, largely due to differences in diagnostic criteria and imaging modalities used across studies [1]. The condition is most frequently diagnosed in women in their fourth and fifth decades of life, making the perimenopausal period a particularly relevant window for clinical management, since symptom severity often peaks in the years preceding menopause.

Several factors have been consistently associated with a higher risk of developing adenomyosis, including advancing age, multiparity, prior uterine surgery and elevated body mass index [2,3]. Mechanistically, adenomyosis is now understood to arise from disruption of the endometrial-myometrial junctional zone, followed by a self-sustaining cycle of local hyperestrogenism, progesterone resistance and chronic tissue injury and repair that drives lesion growth

and symptom generation [4]. This hormonal dysregulation, together with the resulting menstrual dysfunction, provides the biological rationale for hormonal suppression as a cornerstone of medical management, particularly in women who wish to avoid or defer hysterectomy [5].

Diagnostically, transvaginal ultrasonography has become the first-line imaging modality for adenomyosis, offering diagnostic accuracy comparable to magnetic resonance imaging in most clinical settings while remaining more accessible and cost-effective [6,7]. This has facilitated earlier recognition of the disease and broader use of conservative, uterus-sparing hormonal treatments before patients are referred for definitive surgical management.

Among the available hormonal options, the LNG-IUS, oral dienogest and GnRH agonists are the most widely used agents, each acting through different mechanisms to suppress endometrial proliferation and reduce menstrual blood loss and pain [8,9]. Comparative and cohort studies have shown that LNG-IUS effectively reduces uterine volume and bleeding over time, while dienogest is particularly effective in relieving dysmenorrhea and subdermal progestin implants have also demonstrated symptomatic benefit in selected patients [10,11]. However, most of the existing evidence is derived from reproductive-age cohorts and comparative outcome data specific to perimenopausal women, who often carry a heavier symptom burden and greater risk of anemia, remain comparatively scarce [12].

The clinical consequences of untreated or inadequately managed adenomyosis extend beyond menstrual symptoms; heavy menstrual bleeding is strongly associated with iron-deficiency anemia and a measurable decline in quality of life and adenomyosis has additionally been linked to adverse impacts on fertility and reproductive outcomes even in later reproductive life [12,13]. Given the substantial symptomatic and hematological burden this disease imposes on perimenopausal women and the paucity of context-specific outcome data from Bangladeshi clinical settings, there remains a clear need to systematically document real-world treatment responses in this population.

Therefore, this study was undertaken to evaluate the clinical outcomes, patient satisfaction and tolerability of hormonal therapy, comprising LNG-IUS, dienogest and GnRH agonists, in the management of adenomyosis among perimenopausal women, with the aim of generating locally relevant evidence to guide clinical decision-making in similar resource settings.

MATERIALS AND METHODS

This retrospective observational study was conducted in the Department of Obstetrics and Gynaecology, Mugda Medical College & Hospital, Dhaka, Bangladesh, over a period of one year, from June 2023 to July 2024. The study population comprised perimenopausal women diagnosed with adenomyosis on transvaginal ultrasonography who received hormonal therapy during the study period. A total of 150 women who fulfilled the eligibility criteria were enrolled through review of hospital records and outpatient follow-up registers.

Eligibility Criteria

Inclusion criteria:

- Perimenopausal women aged 40–52 years.
- sonographically confirmed diagnosis of adenomyosis.
- presence of at least one major symptom (menorrhagia, dysmenorrhea, or uteromegaly).
- women who received LNG-IUS, dienogest, or GnRH agonist therapy with a documented six-month follow-up.
- Availability of complete baseline and follow-up clinical records.

Exclusion criteria:

- Women with coexisting uterine malignancy or suspected endometrial hyperplasia with atypia.
- Concurrent large uterine fibroids or ovarian pathology confounding symptom assessment.
- Prior hysterectomy or uterine-sparing surgery for adenomyosis.
- Contraindications to hormonal therapy.

Data Collection and Study Variables

Data were extracted retrospectively from hospital case records, outpatient charts, ultrasonographic reports and laboratory records using a structured, pretested data collection sheet. Baseline sociodemographic and clinical characteristics, type of hormonal therapy and treatment outcomes were recorded. The principal clinical outcomes assessed at baseline and six months were menorrhagia, severe pelvic pain or dysmenorrhea and uteromegaly. Hematological outcome was assessed according to the presence of anemia, defined as a hemoglobin level below 11.0 g/dL. Treatment satisfaction and menstrual status at six months were also recorded. Menstrual outcomes were categorized as amenorrhea, hypomenorrhea, regular/normal menstruation, or persistent menorrhagia. Treatment-related adverse effects reported during follow-up were documented, including irregular spotting or breakthrough bleeding, weight gain, hot flashes or mood changes, breast tenderness and acne or oily skin. Participants could report more than one adverse effect; therefore, adverse-effect percentages were not mutually exclusive.

Treatment Groups:

Participants received one of three hormonal treatment modalities according to the treatment documented in their clinical records: LNG-IUS,

dienogest at a dose of 2 mg/day, or GnRH agonist therapy. Treatment allocation was not standardized by the study protocol because of the retrospective observational design.

Outcome Assessment:

Clinical and hematological outcomes were compared between baseline and six months after initiation of hormonal therapy. The primary assessment focused on changes in the prevalence of menorrhagia, severe pelvic pain/dysmenorrhea, uteromegaly and anemia. Secondary outcomes included menstrual status, treatment satisfaction and reported adverse effects at six months.

Statistical Analysis:

Statistical analysis was performed using IBM SPSS Statistics version 25.0. Continuous variables were summarized using mean and standard deviation, while categorical variables were presented as frequencies and percentages. Changes in paired categorical outcomes between baseline and six-month follow-up were assessed using McNemar's test. A two-sided p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Socio-Demographic and Clinical Characteristics of the Study Population (N = 150)

Variable		Frequency (n)	Percentage (%)
Age group (years)	40–44	42	28.0
	45–49	88	58.7
	50–52	20	13.3
	Mean age ± SD (range)	46.8 ± 3.2 (40–52)	
BMI (kg/m²)	Normal (<25.0)	54	36.0
	Overweight (25.0–29.9)	72	48.0
	Obese (≥30.0)	24	16.0
Parity	Primipara (1 child)	22	14.7
	Multipara (≥2 children)	128	85.3
Type of hormonal therapy	LNG-IUS	72	48.0
	Dienogest (2 mg/day)	58	38.7
	GnRH agonists	20	13.3

LNG-IUS = levonorgestrel-releasing intrauterine system; GnRH = gonadotropin-releasing hormone.

Table 1 shows the baseline sociodemographic and clinical characteristics of the study population. The mean age of participants was 46.8 ± 3.2 years, with the majority (58.7%) aged between 45 and 49 years. Nearly half of the women were overweight (48.0%) and most were multiparous (85.3%). The LNG-IUS was the most commonly prescribed hormonal therapy (48.0%), followed by dienogest (38.7%) and GnRH agonists (13.3%).

Table 2: Comparison of Clinical Parameters Before and 6 Months After Hormonal Therapy (N = 150)

Clinical parameter		Pre-treatment, n (%)	Post-treatment at 6 months, n (%)	p-value
Menorrhagia (heavy menstrual bleeding)	Present	138 (92.0)	6 (4.0)	<0.001
	Absent	12 (8.0)	144 (96.0)	
Severe pelvic pain/dysmenorrhea	Present	118 (78.7)	18 (12.0)	<0.001
	Absent	32 (21.3)	132 (88.0)	
Uteromegaly (>12 weeks)	Present	74 (49.3)	22 (14.7)	<0.001
	Absent	76 (50.7)	128 (85.3)	
Anemia (hemoglobin <11.0 g/dL)	Present	104 (69.3)	26 (17.3)	<0.001
	Absent	46 (30.7)	124 (82.7)	

Table 2 presents the comparison of major clinical parameters before and six months after initiation of hormonal therapy. Significant reductions were observed across all assessed parameters: menorrhagia declined from 92.0% to 4.0%, severe pelvic pain or dysmenorrhea from 78.7% to 12.0%, uteromegaly from 49.3% to 14.7% and anemia from 69.3% to 17.3% (p<0.001 for all comparisons). Among women with baseline uteromegaly, more than two-thirds showed resolution at follow-up.

Table 3: Patient Treatment Satisfaction and Menstrual Status at 6-Month Follow-Up (N = 150)

Variable		Frequency (n)	Percentage (%)
Overall treatment satisfaction	Highly satisfied	84	56.0
	Satisfied	46	30.7
	Neutral/uncertain	12	8.0
	Dissatisfied	8	5.3
Menstrual status at 6 months	Achieved amenorrhea	88	58.7
	Hypomenorrhea (scanty bleeding)	41	27.3
	Regular/normal menstruation	15	10.0
	Persistent menorrhagia	6	4.0

Table 3 describes patient treatment satisfaction and menstrual status at the six-month follow-up. The majority of women (86.7%) reported being highly satisfied or satisfied with treatment, while a small proportion (5.3%) expressed dissatisfaction. Regarding menstrual outcome, 58.7% of women achieved amenorrhea, 27.3% experienced hypomenorrhea and only 4.0% had persistent menorrhagia.

Table 4: Adverse Effects Reported During Hormonal Therapy (N = 150)

Adverse effect	Frequency (n)	Percentage (%)
Irregular spotting/breakthrough bleeding	44	29.3
Weight gain (>2 kg)	26	17.3
Hot flashes/mood changes	22	14.7
Breast tenderness	18	12.0
Acne/oily skin	12	8.0
No significant side effects recorded	58	38.7

Participants could report more than one adverse effect; therefore, percentages for individual adverse effects were not mutually exclusive and did not sum to 100%.

Table 4 outlines the adverse effects reported during hormonal therapy. Overall, 61.3% of women experienced at least one adverse effect, most commonly irregular spotting or breakthrough bleeding (29.3%), followed by weight gain (17.3%), hot flashes or mood changes (14.7%), breast tenderness (12.0%) and acne or oily skin (8.0%); 38.7% of women reported no significant adverse effects.

DISCUSSION

The present study evaluated clinical outcomes of hormonal therapy among 150 perimenopausal women with adenomyosis and found substantial improvement in menorrhagia, pelvic pain, uterine size and anemia over six months, alongside high satisfaction and manageable adverse effects. These findings are broadly consistent with the growing body of literature confirming that progestin- and GnRH-based hormonal regimens are effective, uterus-conserving alternatives to hysterectomy in symptomatic adenomyosis.

In the present study, LNG-IUS was the most frequently used therapy (48.0%), consistent with its established role as first-line medical management for adenomyosis-related bleeding. Choudhury *et al.,* compared LNG-IUS with dienogest in a randomized clinical trial and found that both agents significantly reduced pain scores from baseline, with a greater proportion of women in the LNG-IUS arm achieving lighter menstrual bleeding compared with the dienogest group [10]. This pattern parallels our finding that LNG-IUS users, who formed the largest treatment subgroup, contributed substantially to the overall reduction in menorrhagia from 92.0% to 4.0% observed in our cohort. Similarly, Yang *et al.,* reported that dienogest more effectively controlled menstrual volume after six and twelve months of treatment compared with LNG-IUS, while both groups showed significant improvement in endometrial thickness and bleeding parameters, findings that mirror the improvement in uteromegaly and menorrhagia observed across both therapy groups in our study [14]. Ota *et al.,* in a controlled trial comparing LNG-IUS and dienogest over an extended follow-up period, similarly demonstrated significant reductions in visual analog pain scores and bleeding duration with both agents, reinforcing the comparable efficacy of these two progestin-based approaches irrespective of localization of adenomyotic lesions [15].

The marked reduction in pelvic pain observed in our cohort, from 78.7% at baseline to 12.0% at six months, is consistent with Pragash and Khakhar, who reported a reduction in dysmenorrhea visual analog scale scores from 5.54 to 1.37 and blood loss from 66.73 mL to 4.86 mL six months after LNG-IUS insertion, with all outcome measures reaching statistical significance [16]. Wei *et al.,* similarly compared etonogestrel implants with LNG-IUS and found significant symptomatic relief with both modalities, supporting the broader principle that continuous progestin exposure, regardless of delivery route, effectively suppresses adenomyosis-related bleeding and pain [17].

A particularly relevant comparison arises from Chen et al., who specifically examined perimenopausal women aged 40 years and above receiving dienogest for symptomatic adenomyosis and reported that nearly half of the treated patients achieved excellent long-term pain and bleeding control, while older age and larger uterine volume were associated with poorer treatment response [18]. In our study, 58.7% of women achieved amenorrhea and 86.7% reported treatment satisfaction, figures that are consistent with and somewhat more favorable than, those reported by Chen et al., possibly reflecting differences in follow-up duration and the composite use of three hormonal modalities rather than dienogest alone.

The improvement in anemia prevalence observed in our study, from 69.3% to 17.3%, aligns with the well-established relationship between heavy menstrual bleeding and iron-deficiency anemia described by Kocaoz et al., who found that prolonged menstrual duration was significantly associated with declining ferritin levels and impaired quality of life in women of reproductive age [13]. The correction of anemia alongside cessation or reduction of bleeding in our cohort therefore represents a clinically meaningful secondary benefit of hormonal therapy beyond symptom control alone.

Regarding tolerability, irregular spotting was the most common adverse effect in our cohort (29.3%), a pattern consistent with findings from comparative trials of LNG-IUS and dienogest, which similarly report irregular bleeding as the predominant early side effect, generally self-limiting with continued use [10,14]. The overall low rate of serious adverse effects and high treatment continuation implied by our satisfaction data support the favorable safety profile of hormonal therapy described in the wider literature on medical management of adenomyosis, including comprehensive reviews highlighting progestins and GnRH agonists as effective options with manageable side-effect profiles for women wishing to avoid surgical intervention [8,19]. Collectively, these findings reinforce hormonal therapy as an effective, well-tolerated and clinically meaningful strategy for managing adenomyosis in perimenopausal women.

Limitations of the study

This retrospective single-center study lacked a control group, long-term follow-up beyond six months and standardized comparison across hormonal subgroups, which may limit generalizability. Recall and documentation bias cannot be excluded. Multicentric, prospective studies with extended follow-up and head-to-head comparison of hormonal agents are recommended to strengthen the evidence base for individualized treatment selection in perimenopausal adenomyosis.

CONCLUSION

Hormonal therapy, including LNG-IUS, dienogest and GnRH agonists, effectively reduced menorrhagia, pelvic pain, uterine size and anemia among perimenopausal women with adenomyosis, with high patient satisfaction and acceptable tolerability. These findings support hormonal therapy as a safe, effective, uterus-conserving first-line management option for symptomatic adenomyosis in this age group.

Conflict of Interest: None.

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