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Original Article

Comparative study of quality of life between endometriosis patients receiving GnRH agonist and dienogest therapy: A cross-sectional study using Endometriosis Health Profile-30 (EHP-30)

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Abstract

Endometriosis is a chronic gynecological disease that substantially impairs quality of life. Gonadotropin-releasing hormone (GnRH) agonists and dienogest are commonly used hormonal therapies for endometriosis; however, direct comparisons of their effects on quality of life remain limited. This study aimed to compare quality of life between patients with endometriosis receiving GnRH agonist and dienogest therapy using the Endometriosis Health Profile-30 (EHP-30). A comparative cross-sectional study was conducted among 100 patients with endometriosis at Dr. Zainoel Abidin Hospital, Banda Aceh, Indonesia, comprising 50 patients receiving GnRH agonist therapy and 50 receiving dienogest therapy. Quality of life was assessed using the Indonesian version of the EHP-30, with higher scores indicating poorer quality of life. Between-group comparisons and multiple linear regression were performed. Patients receiving dienogest had significantly lower total EHP-30 scores than those receiving GnRH agonist therapy (20.1±9.6 vs 43.7±14.9; $p<0.001$). Significantly lower scores were also observed in all EHP-30 core domains and optional modules in the dienogest group (all $p<0.001$), with the largest differences observed in pain, control and powerlessness, and emotional well-being. In multivariable analysis, dienogest therapy remained independently associated with a lower total EHP-30 score after adjustment for demographic and clinical factors (β=−23.625; 95%CI: −28.803 to −18.447; $p<0.001$). This study highlights that dienogest therapy was associated with better quality of life than GnRH agonist therapy among patients with endometriosis. These findings support the consideration of dienogest as a patient-centered hormonal option when quality of life is a major treatment priority.

Keywords: Endometriosis, GnRH agonist, dienogest, quality of life, EHP-30

Introduction

Endometriosis is a chronic estrogen-dependent gynecological disorder characterized by the presence of endometrial-like tissue outside the uterine cavity. It affects approximately 10% of women of reproductive age worldwide, corresponding to nearly 176 million women, and represents an important cause of pelvic pain, infertility, and impaired quality of life (QoL) [1]. In Indonesia, endometriosis is estimated to affect 10–11% of reproductive-age women, and 30–50% of women with infertility are reported to have this condition [2]. At Dr. Zainoel Abidin Hospital,

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Banda Aceh, Indonesia, 237 new cases of endometriosis were recorded between 2021 and 2022, and 68% of patients presented with moderate-to-severe disease, indicating a substantial burden in this provincial referral hospital [3].

Hormonal therapy is a central component of endometriosis management. Gonadotropin-releasing hormone (GnRH) agonists suppress the hypothalamic-pituitary-ovarian axis and induce a hypoestrogenic state that reduces endometriosis-related pain and lesion activity. However, their use is frequently limited by hypoestrogenic adverse effects, including hot flashes, mood changes, vaginal dryness, and reduced bone mineral density [4,5]. Dienogest, a selective progestogen, has shown comparable effectiveness in controlling endometriosis-associated symptoms, with a more favorable tolerability profile and less disruption to daily functioning [6,7]. These differences may influence not only symptoms but also broader patient-centered outcomes, particularly health-related QoL.

QoL assessment is increasingly recognized as an essential outcome in endometriosis because the disease affects physical, emotional, social, sexual, and occupational functioning. The Endometriosis Health Profile-30 (EHP-30) is a disease-specific instrument developed to capture these multidimensional effects [8]. It consists of 30 core items covering five domains—pain, control and powerlessness, emotional well-being, social support, and self-image—together with six optional modules. The instrument has also been validated in the Indonesian language [8]. Although a previous study has evaluated QoL among patients receiving GnRH agonists or dienogest [9], direct comparisons using EHP-30 in Indonesian patients, particularly in provincial referral hospital settings, remain limited. The aim of this study was therefore to compare QoL between patients with endometriosis receiving GnRH agonist and dienogest therapy using the EHP-30 as well as to assess factors associated with EHP-30 scores among patients at Dr. Zainoel Abidin Hospital, a provincial referral hospital in Banda Aceh, Indonesia.

Methods

Study design and setting

A comparative cross-sectional study was conducted to evaluate health-related QoL among patients with endometriosis who had received either GnRH agonist or dienogest therapy. This design was used to compare patient-reported EHP-30 outcomes between the two treatment groups after exposure to one of the hormonal regimens. The study was conducted at Dr. Zainoel Abidin Hospital in Banda Aceh, Indonesia, a tertiary referral hospital and the main referral center for Aceh Province. Participants were recruited from the Gynecology Outpatient Clinic and Gynecology Inpatient Ward in 2025.

Participants and criteria

Participants were women aged 18–45 years with a diagnosis of endometriosis based on clinical features, including pelvic pain, dysmenorrhea, or dyspareunia, supported by transvaginal ultrasonography. Eligible participants had received GnRH agonist therapy or dienogest at a dose of 2 mg/day for three months and agreed to participate by completing the EHP-30 questionnaire.

Patients were excluded if they had severe comorbid conditions that could independently affect QoL, including uncontrolled metabolic disease, malignancy, severe autoimmune disease, or severe psychiatric illness. Patients who received combined hormonal regimens, switched between GnRH agonist and dienogest during the study period, used other hormonal therapies, or underwent laparotomy or laparoscopy after hormonal treatment were also excluded to minimize treatment misclassification and reduce potential confounding from additional interventions.

Sample size and sampling method

The sample size was calculated for comparison of two independent means, based on a 95% confidence level, 90% statistical power, an assumed pooled standard deviation of 18, and a clinically meaningful difference of 10 points in QoL score. Although the initial calculation indicated 69 participants per group, the final sample was set at 100 patients because of the study period and the availability of eligible patients at the hospital. Therefore, 50 patients were included in each treatment group.

Participants were selected using consecutive sampling. All eligible patients who met the inclusion and exclusion criteria during the study period were recruited sequentially until the required sample size was reached.

Treatment

Patients were grouped into two groups: those who had received GnRH agonist therapy and those who had received dienogest. GnRH agonist therapy included leuprolide acetate, goserelin, or triptorelin, whereas dienogest was administered orally at a dose of 2 mg/day. All included patients received the therapy for three months.

Study procedures

Eligible patients were identified through the Gynecology Outpatient Clinic database and medical records at Dr. Zainoel Abidin Hospital. Potential patients were screened against the predefined inclusion and exclusion criteria, including a confirmed endometriosis diagnosis. Patients who fulfilled the criteria were approached during outpatient or inpatient care, informed about the study procedures, and invited to participate. Written informed consent was obtained before enrolment.

After consent, demographic and clinical data were extracted from medical records and study forms, including age, marital status, education, employment, symptom duration, predominant symptoms, comorbidities, previous therapy, type of hormonal treatment, dose, treatment duration, use of add-back therapy for GnRH agonist, and available post-treatment clinical or imaging evaluation. QoL was then assessed through a structured interview using the Indonesian EHP-30 questionnaire, which required approximately 10 minutes to complete.

Outcome measure

The primary outcome was health-related QoL, assessed using the Indonesian version of the EHP-30. This disease-specific questionnaire comprises 30 core items across five domains—pain, control and powerlessness, emotional well-being, social support, and self-image—together with six optional modules assessing work, relationship with children, sexual relationship, relationship with medical professionals, treatment perception, and infertility [8]. Each item was scored on a Likert scale from 0 (never) to 4 (always). Domain and total scores were transformed to a 0–100 scale, with higher scores indicating poorer QoL [8].

Statistical analysis

Continuous variables were tested for normality using the Kolmogorov–Smirnov or Shapiro–Wilk test and compared using the independent t-test or Mann–Whitney U test, as appropriate. Categorical variables were compared using the Chi-square test or Fisher's exact test. EHP-30 total and domain scores were compared between treatment groups using the independent t-test for normally distributed data or the Mann–Whitney U test for non-normally distributed data. Multiple linear regression was used to assess the independent association between treatment type and total EHP-30 score after adjustment for age, marital status, education, employment status, BMI, symptom duration, predominant symptoms, and infertility history. Results were reported as regression coefficients with 95%CI. A two-sided $p<0.05$ was considered statistically significant, and a 10-point difference in EHP-30 score was considered clinically meaningful. Analyses were performed using SPSS version 25 (IBM Corp., Armonk, NY, USA).

Results

Participant characteristics

A total of 100 patients with endometriosis were included, comprising 50 patients in the GnRH agonist group and 50 patients in the dienogest group (**Table 1**). The mean age was comparable between the GnRH agonist and dienogest groups (35.0±5.27 vs 34.0±6.47 years; $p=0.428$), as was body mass index (25.6±4.49 vs 25.3±3.58 kg/m^2; $p=0.765$). No significant between-group differences were observed in education level, employment status, symptom duration, predominant symptom, or infertility history. Marital status differed significantly between groups ($p=0.014$), with a higher proportion of unmarried patients in the dienogest group (**Table 1**).

Overall, the two groups were broadly comparable in baseline demographic and clinical characteristics, except for marital status.

Table 1. Baseline demographic and clinical characteristics of patients with endometriosis according to treatment group

Characteristic	Study group		*p*-value
	GnRH agonist (n=50)	Dienogest (n=50)	
	n (%)	n (%)	
Age (years), mean±SD	35.0±5.27	34.0±6.47	0.428
Body mass index (kg/m²), mean±SD	25.6±4.49	25.3±3.58	0.765
Marital status (married)	41 (82)	36 (72)	0.014*
Education ≥bachelor	27 (54)	28 (56)	0.974
Employed	37 (74)	38 (76)	0.815
Chronic pelvic pain symptom (symptom duration ≥3 years)	28 (56)	26 (52)	0.689
Predominant symptom: dysmenorrhea	29 (58)	25 (50)	0.420
History of infertility	37 (74)	30 (60)	0.137

GnRH: Gonadotropin-releasing hormone; SD: standard deviation
*Statistically significant at $p<0.05$

EHP-30 scores in the GnRH agonist and dienogest groups

The EHP-30 total and domain scores in each treatment group are presented in **Table 2**. Among patients receiving GnRH agonist therapy, the mean total EHP-30 score was 43.7±14.9, with scores ranging from 20 to 74 (**Table 2**). The highest domain scores were observed for control and powerlessness, emotional well-being, and social support, whereas the lowest scores were observed for the relationship with children and sexual relationship modules.

Among patients receiving dienogest therapy, the mean total EHP-30 score was 20.1±9.6, with scores ranging from 0 to 51.3 (**Table 2**). The highest domain scores were observed for infertility, social support, and control and powerlessness, while the lowest score was observed for the relationship with children module (**Table 2**).

Table 2. Comparison of total EHP-30 scores and its domains' scores between endometriosis patients treated GnRH agonist and dienogest

EHP-30 domain	Scores (mean±SD)		*p*-value
	GnRH agonist	Dienogest	
Pain	44.7±18.2	16.5±13.3	<0.001*
Control and powerlessness	47.9±32.6	21.7±14.6	<0.001*
Emotional well-being	45.5±19.4	20.0±11.5	<0.001*
Social support	45.5±20.0	23.9±13.5	<0.001*
Self-image	38.7±18.5	18.7±12.4	<0.001*
Child relationship (module)	28.0±28.2	6.2±10.1	<0.001*
Sexual relationship (module)	33.7±19.0	14.3±9.2	<0.001*
Medical professional relationship (module)	35.7±16.8	17.5±10.0	<0.001*
Work (module)	36.5±16.6	14.4±10.3	<0.001*
Treatment perception (module)	39.1±11.9	20.6±9.8	<0.001*
Infertility (module)	40.8±19.5	25.0±16.7	<0.001*
Total EHP-30 Score	43.7±14.9	20.1±9.6	<0.001*

EHP-30: Endometriosis Health Profile-30; GnRH: Gonadotropin-releasing hormone.
Higher scores indicate a worse quality of life
*Statistically significant at $p<0.001$

Comparison of total and domain scores

The comparison of EHP-30 total scores and domain scores between treatment groups is presented in **Table 2**. Patients receiving dienogest had significantly lower total EHP-30 scores than those receiving GnRH agonist therapy (20.1±9.6 vs 43.7±14.9; $p<0.001$), indicating better quality of life. Significantly lower scores were also observed in the dienogest group across all EHP-30 core domains and optional modules (all $p<0.001$). The largest between-group differences were observed in pain, control and powerlessness, and emotional well-being domains. The mean difference in total EHP-30 score was 23.6 points, exceeding the 10-point threshold considered clinically meaningful, indicating that the observed difference was both statistically significant and clinically relevant (**Table 2**).

Multivariable analysis of factors associated with quality of life

The results of the multivariate linear regression are presented in **Table 3**. After adjustment for age, BMI, chronic pelvic pain, dyspareunia, and infertility history, treatment type remained the only variable independently associated with total EHP-30 score. Patients receiving dienogest had a mean total EHP-30 score 23.625 points lower than those receiving gonadotropin-releasing hormone agonist therapy (β=−23.625; 95%CI: −28.803 to −18.447; $p<0.001$). Since higher EHP-30 scores indicate poorer QoL, this finding indicates that dienogest therapy was independently associated with better quality of life. None of the other demographic or clinical variables showed a statistically significant association with total EHP-30 score. The model explained 49.0% of the variance in total EHP-30 score ($R^2=0.490$) (**Table 3**).

Table 3. Multivariate linear regression analysis of factors associated with EHP-30 total score

Variable	β coefficient	95% confidence interval	*p*-value
Therapy type (dienogest)	−23.625	−28.803 to −18.447	<0.001*
Age (≥35 years)	2.553	−2.611 to 7.716	0.127
Body mass index (≥25 kg/m²)	−0.311	−5.525 to 4.904	0.341
Chronic pelvic pain symptom	1.708	−4.036 to 7.451	0.458
Dyspareunia symptom	−2.929	−13.347 to 7.488	0.089
History of infertility	1.575	−4.348 to 7.497	0.217
$R^2=0.490$			

*Statistically significant at $p<0.001$

Discussion

This study showed that patients with endometriosis who received dienogest had significantly lower total and domain EHP-30 scores than those who received GnRH agonist therapy, indicating better health-related QoL. The difference was observed across all EHP-30 core domains and optional modules, with the largest differences in pain, control and powerlessness, and emotional well-being. These findings are clinically relevant because endometriosis affects not only pain perception but also emotional functioning, social participation, sexual relationships, work productivity, and fertility-related concerns [10-12].

The better QoL profile observed in the dienogest group is consistent with previous randomized and observational studies showing that dienogest effectively reduces endometriosis-associated pelvic pain while maintaining a favorable tolerability profile. In a randomized placebo-controlled trial, dienogest significantly reduced endometriosis-associated pelvic pain compared with placebo [6]. A head-to-head randomized trial also showed that dienogest was as effective as leuprolide acetate in reducing painful symptoms of endometriosis [14], with subsequent analysis supporting clinically meaningful improvement across pain-related outcomes [15]. These findings support the present result that patients receiving dienogest had lower EHP-30 pain scores than those receiving GnRH agonist therapy.

The observed differences in emotional well-being and control and powerlessness may be partly explained by the distinct endocrine effects of the two therapies. GnRH agonists produce profound hypoestrogenism, which is effective for suppressing endometriotic activity but may cause vasomotor symptoms, mood changes, vaginal dryness, sleep disturbance, and bone mineral density loss [4,16,17]. In contrast, dienogest produces sustained progestogenic suppression with only moderate estrogen reduction, which may preserve better daily functioning and reduce treatment-related discomfort. Pooled safety data from European clinical studies reported that dienogest was generally well tolerated and suitable for longer-term symptom control [18]. This pharmacological difference may explain why dienogest was associated with better scores not only in pain but also in psychosocial and treatment perception domains.

The present findings are also supported by real-world evidence from Asian populations. The ENVISIOeN study showed that dienogest improved EHP-30 scores and endometriosis-associated pelvic pain in routine clinical practice among Asian women with endometriosis [9,19]. This is particularly relevant to the present study because the patient population was drawn from an Indonesian tertiary referral hospital. Together, these findings suggest that the benefit of dienogest on QoL is not limited to controlled trial settings but may also be observed in real-world Asian clinical practice.

The EHP-30 was used in this study because it captures disease-specific aspects of QoL that may not be adequately measured using generic instruments. The EHP-30 was developed as a patient-generated instrument and has demonstrated good validity, reliability, and responsiveness in women with endometriosis [7,20-22]. A systematic review also emphasized that disease-specific instruments are important in endometriosis research because the condition affects multiple domains, including pain, emotional well-being, social relationships, self-image, work, sexual function, and infertility-related concerns [23]. Therefore, the use of EHP-30 strengthens the patient-centered interpretation of the present findings.

In the multivariable analysis, treatment type remained the only independent factor associated with total EHP-30 score. Patients receiving dienogest had a mean total EHP-30 score 23.625 points lower than those receiving GnRH agonist therapy after adjustment for demographic and clinical factors. Because higher EHP-30 scores indicate poorer QoL, this finding indicates an independent association between dienogest therapy and better QoL. The absence of significant associations for age, body mass index, symptom duration, infertility history, chronic pelvic pain, and dyspareunia may suggest that treatment-related differences had a stronger influence on QoL than measured baseline characteristics in this study population. However, this interpretation should be cautious because disease stage, lesion location, previous surgery, baseline pain severity, and pre-treatment QoL were not available in the model.

The impact of endometriosis on QoL has been widely documented. A large multicenter cost-of-illness study showed that reduced QoL was a major determinant of the economic burden of endometriosis, largely through productivity loss and healthcare use [24]. A critical narrative review also showed that endometriosis has substantial social and psychological effects, including impaired intimate relationships, employment difficulties, fertility-related distress, and reduced emotional well-being [25]. These broader effects support the importance of selecting therapies based not only on pain reduction but also on patient-reported outcomes and daily functioning.

This study has some limitations. The cross-sectional design precludes causal inference and does not allow evaluation of within-patient changes from baseline. Treatment assignment was not randomized; therefore, residual confounding by indication, disease severity, fertility intention, lesion phenotype, and clinician preference may have influenced the findings. The study was conducted in a single tertiary referral hospital, which may limit generalizability to other clinical settings. Data on endometriosis stage, lesion characteristics, previous surgery, add-back therapy, adverse effects, treatment adherence, and baseline EHP-30 scores were not fully incorporated. Despite these limitations, the use of a disease-specific QoL instrument and multivariable adjustment provides clinically meaningful evidence that dienogest was associated with better QoL than GnRH agonist therapy in this study population.

Conclusion

Dienogest therapy was associated with significantly better quality of life than GnRH agonist therapy among patients with endometriosis. Patients receiving dienogest had lower total EHP-30 scores and lower scores across all core domains and optional modules, indicating less impairment in pain, emotional well-being, perceived control, social functioning, self-image, work, sexual relationship, treatment perception, and infertility-related concerns. After adjustment for demographic and clinical factors, treatment type remained the only independent factor associated with total EHP-30 score. These findings support the consideration of dienogest as a patient-centered hormonal treatment option for endometriosis, particularly when quality of life is a major therapeutic priority. Prospective multicenter studies with baseline and follow-up EHP-30 assessments are needed to confirm these findings and clarify the long-term quality-of-life effects of both treatment approaches.

Ethics Approval

The study protocol was approved by the Health Research Ethics Committee of Dr. Zainoel Abidin Hospital, Banda Aceh, Indonesia (376/ETIK-RSUDZA/2025).

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Competing interests

The author declares no conflict of interest.

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Underlying data

Derived data supporting the findings of this study are available from the corresponding author on request.

Declaration of artificial intelligence use

This study used artificial intelligence (AI) tool, ChatGPT, in language refinement (improving grammar, sentence structure, and readability of the manuscript). The authors confirmed that all AI-assisted processes were critically reviewed by the authors to ensure the integrity and reliability of the results. The final decisions and interpretations presented in this article were solely made by the authors.

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