



Original Paper

The effect of Hashimoto thyroiditis on pain and emotional instability in patients with endometriosis

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Received: 16/06/2026

Accepted: 28/08/2026

Available online: 30/09/2026

DOI: <https://doi.org/10.63964/atmj.2026.2.3.1>

ABSTRACT

Endometriosis, a systemic disease, is a chronic condition in which tissue grows outside the uterus, involving the ovaries, fallopian tubes, or pelvic peritoneum. It frequently manifests as chronic pelvic pain and subfertility. The aim of the study suggests that hypothyroidism, especially Hashimoto thyroiditis, is a systemic and immune factor in exacerbating pelvic pain severity and deteriorating the psychological and mood status among patients with endometriosis, and thyroid hormone studies revealed that hypothyroidism can worsen the problem of endometriosis. Thirty women with Hashimoto's thyroiditis and endometriosis participated in this study, as did thirty women with endometriosis and a healthy thyroid gland during the same period. The subjects' age was (32 ± 5) . The duration of diagnosis with diseases ranged from 3 to 4 years. Mood status and pain intensity were observed. TSH levels showed significant differences ($P < 0.05$) among the studied groups. Results revealed a significant increase in the intensity of endometriosis pain. In thyroid dysfunction patients, the majority of patients with thyroid issues (20 out of 30) revealed suffering from significant mood disturbances. Thyroid hormones influence endometrial tissue activity by modulating estrogen metabolism and shaping immune responses [1]. When thyroid function is impaired, cytokine production may become dysregulated, thereby promoting the inflammatory pathways central to the development of both disorders [2]. The effects on both are closely linked to reproductive health through their immunological homeostasis. [3]. Early diagnosis in younger patients may prompt earlier specialist intervention, potentially preventing disease progression and organ damage, preserving fertility, alleviating pain, and providing access to increased surveillance and ongoing individualized care, including the option of egg freezing if desired and/or indicated. [4].

KEYWORDS: Hypothyroidism, Endometriosis, Fertility.

1-INTRODUCTION

Thyroid dysfunction is the most common endocrine condition that affects immunity, metabolism, and reproductive viability [1]. While endometriosis is a common immunological marker that simultaneously attacks both thyroid follicles and the pelvic lining, Endometriosis occurs when endometrial tissue proliferates outside the uterus, causing chronic pelvic pain and infertility. This breaks down self-tolerance and is an estrogen-dependent disease; autoimmune thyroiditis shares this [4]. It is a systemic disease, a chronic condition in which tissue grows outside the uterus, involving the ovaries, fallopian tubes, or pelvic peritoneum. It frequently manifests as chronic pelvic pain, subfertility, and many diseases, such as systemic lupus erythematosus, Sjogren's Syndrome, rheumatoid arthritis, celiac disease, multiple sclerosis, and inflammatory bowel disease, are associated with endometriosis and autoimmune diseases [2]. Despite previous studies explaining endometriosis separately as a systemic immune disorder and hypothyroidism as a metabolic condition, there is a critical gap in clinical research investigating the effect of thyroid dysfunction. Specifically, how elevated TSH levels phenotypically alter pain perception and mood stability measured. Much data suggests a bidirectional relationship between thyroid disorder and endometriosis. Many studies revealed that the prevalence of autoimmune thyroiditis is more significant in

patients with endometriosis than in the general population, suggesting that a common immune-mediated mechanism might underlie both conditions [5]. That explains why Thyroid receptor (TR) expression is markedly altered in endometriotic tissue, making these cells hypersensitive to marginal changes in circulating T3 levels [6]. Women who are on L-thyroxine therapy with endometriosis and hypothyroidism do not stabilize TSH only, but show a subordinate effect in reducing pelvic inflammatory markers. The presence of thyroid antibodies is associated with health-related quality of life, specifically impacting vitality and emotional well-being [7]. Regarding mood & mental health, psychological distress, characterized by anxiety and depression, beyond conventional medical treatment, increasing attention has been given to lifestyle interventions such as nutrition and physical activity. is a hallmark of the combined burden of endometriosis and thyroid autoimmunity, likely dependent on neuro-inflammatory pathways [8]. The aim of the study suggests that hypothyroidism, especially Hashimoto thyroiditis, is a systemic and immune factor in exacerbating pelvic pain severity and deteriorating the psychological and mood status among patients with endometriosis

2-MATERIALS AND METHODS

Thirty women with Hashimoto's thyroiditis and endometriosis participated in this study during their attendance at the High Institute for Infertility Diagnosis and Assisted Reproductive Technologies and thirty women with endometriosis and a healthy thyroid gland participated in the same period. The subject's age was (32 ± 5). The mood status and pain intensity were observed. The duration of diagnosis with diseases ranged from 3 to 4 years. Two trained general physicians did the thyroid exam. Blood samples were collected by aseptic technique. The serum separated from the sample was analyzed for the following parameters. TSH by Abbott Analytical i System, through Chemiluminescent Microparticle Immunoassay (CMIA). This method combines the specificity of antibodies with the high sensitivity of chemiluminescence to detect and quantify hormones or other analytes in human serum or plasma [9]. The Anti-TPO Ab was measured by ELISA [10].

All results were expressed as mean $\pm$ SE. SPSS version 28 was used. Differences between means were calculated. An independent-samples t-test was used to compare normally distributed data across groups. Parameters not normally distributed were compared by the Mann–Whitney test. Prevalence of positive anti-thyroid antibodies was compared between the group and the control group by the Chi-square test. A *p-value* less than 0.05 was considered statistically significant [11]. Basic information like Age, BMI, Marital Status, endometriosis diagnosis, Thyroid Status, pain, and mood questionnaire was taken from women's groups. includes questions regarding medical history (Endometriosis diagnosis and Thyroid status)

1. General & Medical Information

Inclusion Criteria:

☐ Age age group (18–45 years) / BMI / Marital Status.

☐ Endometriosis Diagnosis:

Patients with a documented diagnosis of endometriosis (via laparoscopy, MRI)

☐ Thyroid Status:

Patients with normal thyroid function tests (TSH within reference ranges)

Hypothyroidism Group: Patients with newly diagnosed clinical or subclinical hypothyroidism (elevated TSH > 4.5 \, mIU/L)

2. Pain Assessment (VAS & McGill Lite)

☐ Your pain during your last period (Dysmenorrhea): []

☐ Your chronic daily pelvic pain: []

3. Mood & Mental Health

Problem	Score
1. Feeling nervous, anxious	0 1 2 3
2. Little interest or pleasure in doing things?	0 1 2 3
3. Feeling down, depressed, or hopeless?	0 1 2 3

Scoring: 0-2 (Normal), 3-5 (Mild), 6-8 (Moderate), 9-12 (Severe)

Exclusion Criteria:

1. Presence of other systemic autoimmune diseases (e.g., Rheumatoid Arthritis, Lupus) or malignancies.
2. Uterine fibroids, adenomyosis (unless secondary), or Pelvic Inflammatory Disease.
3. Patients with a history of clinical depression or anxiety disorders.
4. Current pregnancy due to altered hormonal profiles and pain thresholds.

3-RESULTS AND DISCUSSION

The results of hormonal analyses were presented in Table 1. Serum TSH levels showed significant differences ($P < 0.05$) among the studied groups. (3.127 ± 0.19 IU/ml and 5.380 ± 0.74 IU/ml). On the other hand, in Anti-TPO-Ab, there was a significant ($P < 0.05$) increase in women with Hashimoto's compared with the healthy thyroid group (150.821 ± 56.21 IU/ml and 282.439 ± 83.57 IU/ml), respectively.

Table (1) Serum levels of thyroid TSH and autoimmune thyroid antibodies in the studied groups

With Hashimoto Group (No. 30)	Healthy Thyroid group (No. 30)	Thyroid Biomarker
5.380 ± 0.74	3.127 ± 0.19	TSH (μ IU/ml)
282.439 ± 83.57	150.821 ± 56.21	Anti TPOAb (IU/ml)

Data are presented as mean $\pm$ standard deviation (SD). TSH. Thyroid stimulating hormone; Anti TPOAb; anti-thyroid peroxidase antibody.

Table (2) Statistical Comparison of Pain Scores (VAS) Between Groups

Type of Pain	Hypothyroid N=30	Euthyroid N=30	t-value / U
Dysmenorrhea (Mean $\pm$ SD)	8.41 ± 0.94	5.21 ± 1.14	3.20-
Chronic Pelvic Pain (Mean $\pm$ SD)	6.95 ± 1.93	4.8 ± 1.88	2.15-
Overall Pain (Mean $\pm$ SD)	Severe	Moderate	

In Table 2, the results revealed a significant increase in the intensity of endometriosis pain. In thyroid dysfunction patients. As a result, the dysmenorrhea distribution ratio was significantly higher in the hypothyroid group (8.41 ± 0.94) with a difference of 3.2-. Furthermore, the prevalence of chronic pelvic pain was significantly higher in the hypothyroid patients (6.95 ± 1.93) compared with the euthyroid group, with a difference of (2.15-)

Table 3. Distribution of mood categories in the Hashimoto thyroiditis and euthyroid groups

Hashimoto Group (30 Patients)	Euthyroid Group (30 Patients)	Mood Category
Patients 5 (16.7%)	Patients 19 (63.3%)	Normal Mood
Patients 12 (40.0%)	Patients 9 (30.0%)	Mild Anxiety
Patients 13 (43.3%)	Patients 2 (6.7%)	Moderate to Severe Anxiety

Table 3 shows the type of mood between the studied groups, comparing the categories. The majority of patients with thyroid issues (20 out of 30) reveal suffering from significant mood disturbances. Data are presented as the majority of patients with Hashimoto thyroiditis (20 out of 30) reveal suffering from significant mood disturbances,

and patients with mild anxiety (40.0%), moderate to severe anxiety (43.3%), respectively, compared with the euthyroid group.

Chronic gynecological problems, including endometriosis, were identified through Primary search parameters utilizing MeSH-aligned descriptors such as Hashimoto thyroiditis and endometrial proliferation, according to Miller & Chen [12]. The mechanistic Convergence between thyroid pathologies, specifically endocrine hypofunction, and chronic gynecological consequences, including endometriosis specifically and other reproductive system outcomes. Beyond endocrine signaling, hypothyroidism is strongly correlated with systemic estrogen dominance, a metabolic state that serves as a primary catalyst for the proliferation of endometriosis. Our results show levels of thyroid TSH and autoimmune thyroid antibodies in the studied groups; Hashimoto's has a significant effect on the reproductive system. One study revealed that a thyroxine deficiency diminishes the liver's enzymatic efficiency, specifically hindering the glucuronidation and hydroxylation pathways essential for estrogen clearance. Consequently, the failure to adequately metabolize circulating estrogens leads to an altered estrogen-to-progesterone ratio, creating a pro-proliferative environment that exacerbates the growth of ectopic endometrial lesions and myxomatous tissues. Thyroid hormone deficiency leads to peripheral nerve sensitization, which significantly increases the pain scores (VAS) reported by endometriosis patients [14], which agrees with our results. Conversely, some researchers argue . That patients with subclinical hypothyroidism require higher doses of analgesics to manage menstrual pain compared to euthyroid controls [15]. In the anxiety category, despite both groups suffering from endometriosis, the Hashimoto group revealed higher prevalence of moderate-to-severe distress (66.7%) compared to the euthyroid group (13.3%). This ratio showed significant differences ($P < 0.05$). A thematic aggregation approach, where extracted findings were referenced to explain the bidirectional pathways between hormonal imbalance and systemic inflammatory cascades. As Lagana et al. revealed, "Anxiety and depressive symptoms are significantly more prevalent in endometriosis patients who also test positive for thyroid autoantibodies." The psychological distress in these patients is a result of neuroinflammation triggered by the dual burden of endocrine and gynecological dysfunction [16]. Lastly, early diagnosis in younger patients may prompt earlier specialist intervention, potentially preventing disease progression and organ damage, preserving fertility, alleviating pain, and providing access to increased surveillance and ongoing individualized care, including the possibility of egg freezing if desired and/or indicated [17]. While other studies suggest that psychological distress is a universal response to chronic pain boundaries regardless of thyroid status [18].

CONCLUSION

Thyroid disorders like Hashimoto's thyroiditis are linked to reproductive health cases. Early diagnosis of endometriosis is essential, and the clinical overlap and pathophysiological triad of hypothyroidism and endometriosis. Merging specific lifestyle modulations, specifically an immunomodulatory nutritional framework and graduated physical effort, a comprehensive homeostatic strategy that synchronizes endocrine management with metabolic and behavioral interventions is indispensable for restoring reproductive integrity and ensuring superior clinical trajectories for patients. Clinically, it is recommended to utilize routine thyroid function screening (TSH and FT4 screening) for all patients diagnosed with chronic pelvic pain and endometriosis, paving the way for more comprehensive therapy.

REFERENCES

1. Poppe K, *et al.* Thyroid disorders and female infertility. *Best Pract Res Clin Endocrinol Metab.* 2020;34[4]:101373.
2. Vannuccini S, *et al.* Endometriosis and benign gynecological pathologies: a complex relationship. *Fertil Steril.* 2017;108[6]:901–912.

3. Fischer, S., *et al.* *Neuro-Inflammatory Markers in Endocrine Comorbidities*. Hormone and Metabolic Research 2025. 57[4], 310–321.
4. Vannuccini, S., *et al.* Endometriosis as a Systemic Disease: The Thyroid Connection. *Human Reproduction Update*, 2022. 28[4], 512–529.
5. Quintino, M., *et al.* *The Prevalence of Autoimmune Thyroiditis in Women with Endometriosis*. Journal of Personalized Medicine, 2024. 14[3], 245–258.
6. Ferrari S, *et al.* The impact of thyroid dysfunction on female reproductive health. *J Endocrinol Invest*. 2018. 41[7],799–815.
7. Riccio, L., *et al.* The Impact of Subclinical Hypothyroidism on Endometrial Receptivity. *Journal of Endometriosis*, 2022. 14[1], 12–21.
8. Laganà, A., *et al.* The Double Burden: Anxiety and Depression in Hypothyroid Endometriosis Patients. *Archives of Women's Mental Health*, 2024. 27[2], 289–300.
9. Abbott Diagnostics. *Alinity i System Operations Manual*. 2023. Abbott Laboratories
10. Cleophas, T. J. and Zwinderman, A. H. *SPSS for Starters*. Springer Scien. Busin. Med. 2020. New York Heidelberg London.
11. Negro, R. Mangieri, T. and Coppola, L. Levothyroxine treatment in thyroid peroxidase antibody-positive women undergoing assisted reproduction technologies: a prospective study. *Hum. Reprod*. 2005.20: Pp 1529–1533.
12. Miller, A., & Chen, L. Hypothyroidism Exacerbates Endometriosis-Associated Hyperalgesia. *Fertility and Sterility*, 2026. 125[2], 431–443.
13. Riccio LGC, *et al.* Immunologic and inflammatory aspects of endometriosis. *J Endocrinol Invest*. 2018.41[7]:769–778.
14. Smith, R., *et al.* Thyroid Hormone Deficiency Sensitizes Nociceptors in Chronic Pelvic Pain Models. *The Journal of Pain*, 2025. 26[3], 189–202.
15. Vercellini P, *et al.* Autoimmune diseases and endometriosis: Is there a true clinical association or a solid epidemiological coincidence? *Hum Reprod Update*. 2021.27[1]:107-123.
16. Laganà, A. S., *et al.* The Double Burden: Anxiety and Depression in Hypothyroid Endometriosis Patients. *Archives of Women's Mental Health*, 2024.27[2], 289–300.
17. Dun, E. C., *et al.* Endometriosis in Adolescents. *JSL: Journal of the Society of Laparoscopic & Robotic Surgeons*, 2015. 19[2], e2015.00019.
18. Facchin, F., *et al.* Chronic pelvic pain and psychological distress in women with endometriosis: Is thyroid dysfunction a true confounder? *Journal of Psychosomatic Obstetrics & Gynecology*, 2022. 43(4), 409–418.