

CLINICAL SIGNIFICANCE OF ENDOCRINE AND METABOLIC FACTORS IN MENSTRUAL CYCLE DISORDERS

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Abstract. *Menstrual cycle disorders are an important clinical problem among women of reproductive age, and their development is significantly influenced by endocrine and metabolic factors. The aim of this study was to assess the clinical significance of endocrine and metabolic factors in menstrual cycle disorders. The study evaluated clinical and anamnestic data, anthropometric parameters, hormonal and metabolic status, and pelvic ultrasonography findings.*

The results demonstrated that menstrual cycle disorders may be associated with thyroid dysfunction, hyperprolactinemia, polycystic ovary syndrome, changes in body weight, and metabolic abnormalities.

Keywords: *menstrual cycle, menstrual cycle disorders, endocrine factors, metabolic factors, polycystic ovary syndrome, hyperprolactinemia, thyroid dysfunction, insulin resistance, reproductive health.*

Introduction

Menstrual cycle disorders are an important clinical problem among women of reproductive age, and endocrine and metabolic factors play a significant role in their development. Dysfunction of the hypothalamic–pituitary–ovarian axis, insulin resistance, thyroid dysfunction, hyperprolactinemia, and changes in body weight may adversely affect menstrual regularity. In particular, the combination of hormonal and metabolic abnormalities in polycystic ovary syndrome may contribute to anovulatory menstrual disorders. Early identification of endocrine and metabolic factors is important for determining the causes of menstrual disorders, assessing reproductive function, and preventing potential complications. Therefore, comprehensive assessment of hormonal and metabolic parameters in women with menstrual cycle disorders represents an important aspect of modern gynecological practice.

Relevance

Menstrual cycle disorders are common reproductive health problems that may negatively affect the reproductive function and overall health of women of reproductive age. Endocrine and metabolic factors, including thyroid dysfunction, hyperprolactinemia, insulin resistance, increased or decreased body weight, and polycystic ovary syndrome, play an important role in the development of menstrual abnormalities. Early identification of these factors is essential for appropriate diagnosis, assessment of reproductive function, and prevention of potential complications.

Materials and methods

Menstrual cycle regulation depends on the coordinated function of the hypothalamic–pituitary–ovarian axis. Endocrine disturbances at any level of this system may lead to abnormalities in menstrual frequency, duration, and regularity. Thyroid dysfunction is one of the endocrine conditions that may affect reproductive function through alterations in gonadotropin secretion and sex hormone metabolism. Both hypothyroidism and hyperthyroidism may be associated with changes in menstrual bleeding patterns. Hyperprolactinemia may suppress gonadotropin-releasing hormone secretion and subsequently impair follicular development and ovulation. Polycystic ovary syndrome is another major endocrine disorder associated with menstrual irregularity, particularly oligomenorrhea and anovulation. Increased androgen production and altered ovarian steroidogenesis contribute to impaired follicular maturation.

Functional hypothalamic disturbances may also occur in association with significant psychological stress, inadequate energy intake, excessive physical activity, or substantial weight loss. Therefore, endocrine evaluation is an important component of the clinical assessment of women with persistent menstrual abnormalities. Identification of the specific endocrine disorder allows the underlying mechanism to be addressed rather than treating menstrual symptoms alone.

Metabolic status has an important relationship with reproductive endocrine function and menstrual regularity. Excess body weight and obesity are frequently associated with insulin resistance and hyperinsulinemia, which may influence ovarian steroidogenesis and contribute to ovulatory dysfunction. These mechanisms are particularly relevant in women with polycystic ovary syndrome, where metabolic abnormalities may coexist with hyperandrogenism and irregular menstruation. Conversely, insufficient body weight and inadequate energy availability may suppress hypothalamic reproductive function and result in oligomenorrhea or amenorrhea. Rapid changes in body weight may also disrupt the normal interaction between metabolic signals and the hypothalamic–pituitary–ovarian axis. Metabolic abnormalities may therefore affect both the frequency of menstruation and the probability of normal ovulation. Assessment of body mass index, nutritional status, and relevant metabolic parameters can provide additional information during the evaluation of menstrual disorders. In women with suspected metabolic dysfunction, evaluation of glucose metabolism and other cardiovascular and metabolic risk factors may be clinically appropriate. A comprehensive assessment of metabolic status is particularly important when menstrual irregularity occurs together with obesity, hyperandrogenic manifestations, or other features suggestive of insulin resistance.

The combined assessment of endocrine and metabolic factors is important for establishing the underlying cause of menstrual cycle disorders and determining appropriate clinical management. A detailed menstrual history should be complemented by evaluation of body weight, clinical signs of endocrine dysfunction, reproductive history, and relevant comorbidities.

Depending on the clinical presentation, laboratory assessment may include thyroid-stimulating hormone, prolactin, gonadotropins, and other reproductive hormones. In women with features suggestive of polycystic ovary syndrome, assessment of androgen status and metabolic parameters may provide additional diagnostic information. Identification of insulin resistance or significant metabolic abnormalities may also have implications for long-term health beyond reproductive function.

Early recognition of endocrine disorders can facilitate appropriate treatment and may improve menstrual regularity and ovulatory function. Similarly, addressing nutritional deficiencies, excessive weight gain, or insufficient energy availability may contribute to restoration of normal reproductive function in selected patients. Therefore, menstrual cycle disorders should be evaluated within a broader endocrine and metabolic context. Such an integrated approach improves the identification of underlying risk factors and supports individualized management aimed at preserving reproductive and overall health.

Results

The study findings demonstrated that endocrine and metabolic factors have important clinical significance in women with menstrual cycle disorders. The most frequently observed factors included increased body weight, polycystic ovary syndrome, thyroid dysfunction, and hyperprolactinemia. Women with increased body weight more frequently demonstrated menstrual irregularity and ovulatory dysfunction. In patients with polycystic ovary syndrome, oligomenorrhea, hyperandrogenism, and metabolic abnormalities were frequently observed simultaneously. Thyroid dysfunction was also identified as an important factor affecting menstrual regularity and cycle duration. Women with hyperprolactinemia demonstrated disturbances in ovulatory function and delayed menstruation. These findings indicate the importance of comprehensive assessment of hormonal and metabolic status in women with menstrual cycle disorders.

Conclusion

Endocrine and metabolic factors have important clinical significance in the development of menstrual cycle disorders. Thyroid dysfunction, hyperprolactinemia, polycystic ovary syndrome, insulin resistance, and changes in body weight may negatively affect menstrual regularity.

Therefore, the evaluation of women with menstrual disorders should not be limited to gynecological examination but should also include comprehensive assessment of endocrine and metabolic status. Early identification of hormonal and metabolic abnormalities may contribute to preservation of reproductive function, prevention of complications, and selection of individualized management strategies.

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