

**DIAGNOSTIC VALUE OF LABORATORY AND INSTRUMENTAL
EXAMINATIONS IN THE EARLY DETECTION OF PREMENSTRUAL
DISORDERS IN ADOLESCENT GIRLS**

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Annotation

Premenstrual disorders are frequently observed in adolescent girls during maturation of the reproductive system and often remain undiagnosed because their manifestations are considered normal pubertal changes. Timely diagnosis is important for prevention of emotional disturbances, reduced academic performance, and future reproductive dysfunction. This study assessed the diagnostic value of laboratory and instrumental examinations in the early detection of premenstrual disorders in adolescent girls. A total of 186 girls aged 13–19 years were examined. Clinical assessment was combined with hormonal, biochemical, and ultrasonographic investigations. Premenstrual disorders were identified in 64.5% of participants. Significant associations were found between clinical symptoms and low luteal progesterone, iron deficiency, vitamin D insufficiency, and functional ovarian changes on ultrasound. The combined use of laboratory and instrumental methods increased early diagnostic accuracy and allowed identification of hidden etiological factors. Comprehensive screening is recommended in adolescents with recurrent premenstrual complaints.

Keywords: premenstrual disorders, adolescents, laboratory diagnosis, ultrasound, hormonal profile, early detection, menstrual health.

Introduction

Premenstrual disorders represent a group of cyclic somatic and psychoemotional symptoms developing during the luteal phase of the menstrual cycle and disappearing after menstruation begins. In adolescence, diagnosis is complicated by immaturity of the hypothalamic-pituitary-ovarian axis and variability of menstrual function. Many girls receive symptomatic treatment without clarification of the underlying cause.



Laboratory and instrumental investigations may reveal endocrine imbalance, micronutrient deficiency, or ovarian dysfunction at an early stage. The aim of this study was to determine the diagnostic significance of such methods in adolescent girls with premenstrual complaints.

Materials and Methods

A clinical observational study was conducted among 186 adolescent girls aged 13–19 years. Participants were divided into two groups: 120 girls with recurrent premenstrual symptoms and 66 practically healthy controls. All participants underwent clinical examination and menstrual history assessment. Laboratory testing included complete blood count, ferritin, serum magnesium, vitamin D, thyroid-stimulating hormone, prolactin, estradiol, and progesterone. Pelvic ultrasonography was performed during the follicular and luteal phases when indicated. Statistical analysis was carried out using SPSS 26.0. Differences were considered significant at $p < 0.05$.

Results and Discussion

Premenstrual disorders were diagnosed in 64.5% of examined adolescents. Moderate and severe forms were more common in girls aged 16–19 years.

Low luteal progesterone levels were found in 41.7% of symptomatic participants compared with 15.2% in controls ($p < 0.01$). Iron deficiency was identified in 36.6% versus 18.1% ($p < 0.05$), while vitamin D insufficiency was present in 48.3% versus 24.2% ($p < 0.01$). Reduced magnesium levels were significantly associated with irritability, fatigue, and headache. Pelvic ultrasonography revealed multifollicular ovarian morphology, delayed ovulation signs, and small functional cysts in 28.4% of girls with moderate or severe symptoms. No significant structural pathology was detected in the control group. The results indicate that premenstrual disorders in adolescents are frequently associated with measurable hormonal and metabolic disturbances. Symptom-based diagnosis alone may overlook clinically important factors requiring correction.

Conclusion and Recommendations

Laboratory and instrumental examinations have substantial diagnostic value in the early detection of premenstrual disorders in adolescent girls. Determination of progesterone status, ferritin, vitamin D, magnesium, and thyroid profile, together with pelvic ultrasonography, improves diagnostic precision and supports individualized treatment. Adolescent girls with persistent or severe premenstrual symptoms should undergo targeted clinical screening to prevent progression of menstrual, emotional, and reproductive complications.



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