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MODERN MANAGEMENT ALGORITHMS FOR MENSTRUAL DYSFUNCTION IN ADOLESCENTS: FROM PATHOGENESIS TO EVIDENCE-BASED PRACTICE

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Abstract

Pubertal maturation of the hypothalamic–pituitary–ovarian axis is often accompanied by menstrual irregularities requiring careful differentiation between physiological and pathological conditions. This study evaluated diagnostic and treatment approaches in 120 adolescents with menstrual disorders. Abnormal uterine bleeding predominated (62%). Tranexamic acid was effective in 78% of cases, while combined oral contraceptives showed higher efficacy (92%) but more side effects. BMI significantly influenced risk, and dydrogesterone therapy achieved cycle stabilization in 84% of patients. A differentiated approach improves clinical outcomes.

Keywords: Adolescents, menstrual cycle disorders, abnormal uterine bleeding, dysmenorrhea, secondary amenorrhea, dydrogesterone, combined oral contraceptives, tranexamic acid, body mass index, HPO axis, evidence-based medicine.

Introduction

The establishment of reproductive function during puberty is a complex process that takes approximately 3-5 years post-menarche. During this period, the HPO system characterized by functional instability. Clinicians must distinguish

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between normal developmental variations and true pathology to avoid unnecessary hormonal interventions.

The aim of our study was to systematize diagnostic and treatment approaches for adolescent menstrual dysfunction based on evidence-based medicine and evaluate the effectiveness of differentiated therapy.

Methods

A retrospective analysis of 120 patients aged 13–18 years with menstrual cycle disorders (MCD) was performed. The methods included anthropometry, transabdominal pelvic ultrasound, hormonal profiling (FSH, LH, prolactin, TSH, and testosterone measured on days 2–5 of the menstrual cycle), and coagulation screening. The diagnostic protocol followed a "diagnostic ladder" approach, including screening, laboratory tests, endocrine evaluation, and imaging.

Results and Discussion

Analysis of data from 120 patients revealed several statistically significant findings (statistical processing was performed using Student's t-test and Pearson's chi-square test). The structure of menstrual pathology was as follows: abnormal uterine bleeding predominated (62%), followed by dysmenorrhea (21%), secondary amenorrhea (12%), and other disorders, including coagulation abnormalities (5%).

In terms of hemostatic efficacy, the administration of tranexamic acid at a dosage of 30–45 mg/kg/day resulted in cessation of abnormal uterine bleeding in 78% of patients within the first 48 hours, without the need for hormonal hemostasis. The use of monophasic combined oral contraceptives (containing 30 µg ethinyl estradiol) demonstrated higher efficacy (92%) in achieving bleeding control; however, adverse effects were observed in 18% of patients, including nausea and intermenstrual spotting during the subsequent cycle.

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A statistically significant correlation was identified between body mass index (BMI) and the type of menstrual disorder. A strong positive association was observed between low BMI (<17.5) and the risk of secondary amenorrhea. Conversely, patients with excess body weight (BMI >25) had a 2.8-fold higher risk of menstrual disorders compared to individuals with normal BMI (95% CI: 1.4–5.2).

Regarding cycle regulation therapy, cyclic administration of dydrogesterone (10 mg twice daily for 3–6 months) resulted in stabilization of the menstrual cycle in 84% of patients.

Moreover, three months after discontinuation of therapy, endogenous progesterone levels in the luteal phase were significantly higher in the dydrogesterone group compared to the COC group, indicating preservation and support of intrinsic ovarian function.

Table 1 Step-by-step diagnostic protocol for adolescent MCD

Stage	Method	Diagnostic goal
I. Screening	Anamnesis, BMI, hCG test	Rule out pregnancy and nutritional deficiencies
II. Basic Lab	CBC, Ferritin, Coagulation profile	Assess anemia and rule out von Willebrand disease
III. Endocrine	TSH, Free T4, Prolactin	Rule out thyroid dysfunction and prolactinoma
IV. Hormones	FSH, LH, Testosterone (days 2-5)	Assess HPO maturity and screen for hyperandrogenism
V. Imaging	Pelvic Ultrasound (Transabdominal)	Assess ovarian volume and endometrial thickness
VI. Expert	Pituitary MRI, Karyotyping	Differential diagnosis of genetic/organic conditions

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Conclusion

Modern evidence-based practice for adolescents emphasizes a "hormone-sparing" approach. First-line therapy should include BMI normalization, nutritional support, and non-hormonal hemostasis. Cyclic progestogen therapy remains the gold standard for cycle regulation when conservative measures fail, as it preservers the maturing HPO system physiological potential.

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