

Re-evaluating Endometriosis Management in Adolescents: Clinical Challenges and Emerging Strategies

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ABSTRACT

Endometriosis is a chronic gynecologic condition that often begins in adolescence but remains underdiagnosed due to nonspecific symptoms and lack of awareness. Early identification and management are crucial to reduce pain, preserve fertility, and improve psychosocial well-being. This commentary examines diagnostic challenges, evaluates current and emerging management strategies-including medical therapy, minimally invasive diagnostics, and multidisciplinary care-and explores global disparities in adolescent care. Additionally, it discusses the role of digital health, patient-centered approaches, and public health initiatives in improving outcomes.

INTRODUCTION

Endometriosis is estimated to affect approximately 10% of reproductive-age individuals globally, with adolescent prevalence ranging from 1% to 5%. However, the true prevalence is likely higher due to underdiagnosis and misattribution of symptoms. The condition is characterized by the presence of endometrial-like tissue outside the uterine cavity, leading to chronic pelvic pain, dysmenorrhea, fatigue, and, in severe cases, infertility[1].

Adolescence is a critical period for early intervention. Symptoms often begin shortly after menarche, yet diagnosis can be delayed for years. Adolescents frequently normalize severe menstrual pain, and healthcare providers may misdiagnose symptoms as primary dysmenorrhea or gastrointestinal disorders. These delays can result in disease progression, formation of adhesions, ovarian cysts, and long-term reproductive complications [2-3].

DESCRIPTION

Global Burden and Disparities

The burden of adolescent endometriosis varies widely across regions. High-income countries may offer advanced diagnostic tools, access to laparoscopy, and multidisciplinary care, yet delays in diagnosis remain common. In low- and middle-income countries, limited healthcare infrastructure, scarcity of specialists, cultural stigma, and lack of awareness contribute to substantial underdiagnosis [4-5].

Maternal and reproductive health implications: Delayed treatment can impair fertility and increase the risk of chronic pelvic pain syndromes.

Economic and societal impact: Missed school days, decreased productivity, and psychological distress contribute to long-term social and economic burdens.

Clinical Challenges in Adolescents

Symptom Recognition and Misdiagnosis: Chronic pelvic pain, dysmenorrhea, and gastrointestinal complaints are common but nonspecific. Misdiagnosis may include irritable bowel syndrome, urinary tract infections, or psychosomatic conditions. Adolescents may delay seeking care due to embarrassment or normalization of menstrual pain, highlighting the need for increased awareness among families, educators, and clinicians.

Diagnostic Limitations: Surgical diagnosis (laparoscopy): Gold standard but invasive, requires anesthesia, and carries risks of adhesions and complications. Imaging modalities: Ultrasound and MRI detect ovarian endometriomas but often fail to identify peritoneal or superficial lesions. Emerging biomarkers: Research into CA-125, microRNAs, cytokine profiles, and proteomic markers is ongoing, but clinical utility in adolescents remains limited.

Psychosocial Impact: Chronic pain affects academic performance, social engagement, and overall quality of life. Adolescents experience increased rates of anxiety, depression,

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and sleep disturbances. Peer support groups, mental health interventions, and family counseling play a critical role in holistic care.

Treatment Challenges: Hormonal therapies, including oral contraceptives, progestins, and GnRH analogs, are effective but may cause side effects such as mood changes, bone density reduction, or growth concerns. Surgical interventions are considered for refractory cases but carry recurrence risk. Adherence is affected by side effects, lack of support, and insufficient education regarding disease management.

Emerging Strategies in Diagnosis and Management

Medical Therapy and Personalization: Hormonal suppression remains first-line therapy for adolescents with moderate-to-severe symptoms. Individualized regimens consider age, growth status, side-effect profiles, and patient preferences. Non-hormonal therapies, including NSAIDs and emerging anti-inflammatory agents, are adjunctive for pain management.

Minimally Invasive Diagnostics: High-resolution transvaginal ultrasound: Improves detection of ovarian lesions and adhesions. MRI: Useful in mapping deep infiltrating endometriosis. Biomarkers: CA-125, microRNAs, and cytokine panels are under investigation for early, non-invasive detection. Digital symptom tracking: Mobile applications enable real-time pain and cycle tracking, assisting clinicians in recognizing patterns suggestive of endometriosis.

Multidisciplinary Care: Involves gynecologists, pain specialists, physical therapists, psychologists, and nutritionists. Addresses physical symptoms, mental health, and lifestyle factors concurrently. Family education and school collaboration support adherence and academic performance.

Patient-Centered Approaches: Adolescents should be actively involved in decision-making. Shared decision-making improves adherence, satisfaction, and long-term outcomes. Mobile apps and online educational resources enhance engagement and self-management.

Global and Public Health Considerations

Health Equity: Disparities exist in access to diagnostic tools, treatment options, and multidisciplinary care. Telemedicine, mobile clinics, and community health initiatives offer potential solutions in underserved regions.

Education and Awareness: Awareness campaigns targeting adolescents, families, and educators can reduce delays in diagnosis. Training primary care providers to recognize early symptoms is essential.

Policy Implications: Integration of adolescent endometriosis care into national reproductive health programs is needed. Insurance coverage for medical therapy, minimally invasive procedures, and counseling services can reduce financial barriers.

Illustrative Case Examples (Hypothetical)

Case A: A 15-year-old experiences severe menstrual pain and fatigue, initially misdiagnosed as primary dysmenorrhea.

Symptom tracking via a mobile app highlighted cyclical patterns, prompting early referral and medical therapy initiation, resulting in symptom reduction and improved school attendance.

Case B: A 17-year-old presents with persistent pelvic pain and anxiety. Multidisciplinary care, including hormonal therapy, physical therapy, and counseling, led to improved pain management, mental well-being, and quality of life.

These examples underscore the importance of early recognition, non-invasive monitoring, and comprehensive care.

Future Directions

Research: Validation of non-invasive diagnostic biomarkers in adolescent populations. Long-term studies comparing medical therapy, surgical intervention, and combined approaches. Investigating the role of genetics, epigenetics, and environmental factors in adolescent endometriosis onset and progression.

Clinical Practice: Development of adolescent-specific guidelines for diagnosis, treatment, and follow-up. Integration of telehealth and digital monitoring tools to enhance access and adherence. Training programs for school health staff and primary care clinicians.

Public Health Initiatives: Awareness campaigns targeting adolescents and caregivers. Community-based screening programs to identify high-risk individuals early. Policy frameworks supporting equitable access to care and inclusion in national health programs.

CONCLUSION

Adolescent endometriosis remains underrecognized and undertreated, resulting in prolonged pain, impaired quality of life, and potential long-term reproductive complications. Early recognition, individualized medical therapy, minimally invasive diagnostics, multidisciplinary care, and patient-centered approaches are essential to improve outcomes. Global health initiatives, policy support, and public awareness are critical to reducing disparities in care. By integrating clinical, educational, and technological strategies, the burden of adolescent endometriosis can be mitigated, enhancing physical, reproductive, and psychosocial well-being.

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