Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-10, Issue-5 | September-October 2024
https://doi.org/10.53339/aimdr.2024.10.5.5
Page no- 31-38 | Section- Research Article (Obstetrics & Gynaecology)

Prevention and Management of Endometriosis in Adolescent Girls

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Received: 14 May 2024
Revised: 25 June 2024
Accepted: 10 July 2024
Published: 31 August 2024

Abstract

Background: Endometriosis is a chronic gynecological condition characterized by the presence of endometrial-like tissue outside the uterus, leading to symptoms such as pelvic pain, dysmenorrhea, and infertility. This study aims to investigate the prevention and management strategies for endometriosis in adolescent girls, focusing on both medical and surgical interventions, as well as the effectiveness of preventive measures. **Material & Methods:** This study is designed as a prospective cohort study at the Department of Obstetrics & Gynaecology in Mymensingh Medical College, Mymensingh, Bangladesh from July 2020 to July 2022. The study enrolled 88 adolescent girls aged 12-18 years who have been diagnosed with endometriosis through laparoscopy or imaging. Data were analyzed by SPSS (Statistical Package for Social Sciences) version 22.0. Statistical analysis involved descriptive statistics for baseline characteristics, comparative analysis between intervention groups using t-tests and chi-square tests, and longitudinal analysis using mixed-effects models, with statistical significance set at $p<0.05$. **Results:** In this study, progestins demonstrated a 65% response rate but were associated with weight gain. GnRH agonists showed an 80% response rate with side effects such as hot flashes, while aromatase inhibitors had a 70% response rate and were linked to joint pain. Surgical outcomes indicated that laparoscopy provided 90% pain relief with a 10% complication rate and 15% recurrence, whereas laparotomy resulted in 85% pain relief, 15% complications, and 20% recurrence. Quality of life measures showed significant improvements, with pain scores decreasing from 8.5 to 3.2, activity limitations reducing from 70% to 30%, and psychological well-being increasing from 50% to 80% after treatment. **Conclusions:** Effective prevention and management of endometriosis in adolescent girls involve early detection, appropriate medical treatments, and preventive measures. Key strategies include using combined oral contraceptives (COCs) and lifestyle modifications to reduce symptoms, supported by education programs to improve awareness. Progestins, GnRH agonists, and aromatase inhibitors are effective treatments, with laparoscopy being a successful surgical option.

Keywords:- Endometriosis, Adolescent, Prevention, Management.

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INTRODUCTION

Endometriosis is a chronic, estrogen-dependent condition characterized by the presence of endometrial-like tissue outside the uterus, leading to chronic pelvic pain, dysmenorrhea, and potential infertility. Although traditionally considered a condition affecting adult women, endometriosis is increasingly recognized as a significant problem in adolescent girls.[1] The prevalence of endometriosis in adolescent girls presenting with chronic pelvic pain is estimated to be between 25% and 38%.[2] The clinical presentation in adolescents often includes severe dysmenorrhea unresponsive to standard medical treatments, chronic pelvic pain, and gastrointestinal symptoms, which can be mistaken for other conditions such as irritable bowel syndrome or appendicitis.[3] Prevention strategies for endometriosis primarily focus on modifiable risk factors. These include the management of menstrual health through hormonal therapies that suppress menstruation, such as combined oral contraceptives (COCs), progestins, and gonadotropin-releasing hormone (GnRH) agonists. COCs, in particular, are widely used due to their efficacy in reducing menstrual flow and alleviating dysmenorrhea, thereby potentially decreasing the retrograde menstruation thought to contribute to endometriosis development.[4] Lifestyle modifications, including maintaining a healthy weight and reducing exposure to environmental toxins, are also recommended, although evidence supporting these interventions is less robust.[5] Management of endometriosis in adolescents aims to control pain, preserve fertility, and prevent disease progression. Medical management is the first line of treatment, with NSAIDs and hormonal therapies being the mainstays. NSAIDs are effective in managing pain, while hormonal therapies, including COCs, progestins, and GnRH agonists, help to suppress endometrial growth and reduce pain.[6] Recent studies have also explored the use of aromatase inhibitors, which inhibit estrogen production and have shown promise in refractory cases.[7] Surgical intervention, typically via laparoscopy, is considered for adolescents who do not respond to medical treatment or have severe symptoms. The goal of surgery is to excise or ablate endometrial lesions, which can provide significant symptom relief and improve quality of life. However, the decision to perform surgery must be carefully weighed against the potential risks, including postoperative adhesion formation and the impact on future fertility.[8] Postoperative medical therapy is often recommended to prevent the recurrence of symptoms.[9] Emerging treatments, such as the use of selective progesterone receptor modulators and immune-modulating therapies, are currently being investigated and hold promise for more effective management of endometriosis in the future. Additionally, a multidisciplinary approach involving gynecologists, pain specialists, and mental health professionals is essential to address the complex needs of adolescents with endometriosis comprehensively.[10] This study aims to assess the preventive measures and management of endometriosis in adolescent girls.

MATERIAL AND METHODS

This study is designed as a prospective cohort study at the Department of Obstetrics &

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Gynaecology in Mymensingh Medical College, Mymensingh, Bangladesh from July 2020 to July 2022. The study enrolled 88 adolescent girls aged 12-18 years who have been diagnosed with endometriosis through laparoscopy or imaging. Written informed consent, including parental consent, if under 18, was taken for participation.

Inclusion Criteria

- Adolescent girls aged 12-18 years
- Diagnosed with endometriosis through laparoscopy or imaging
- Experiencing chronic pelvic pain for more than 6 months
- Regular menstrual cycles for at least 6 months before study entry
- No prior surgical treatment for endometriosis
- Willing to provide written informed consent (parental consent if under 18)

Exclusion Criteria

- History of pelvic inflammatory disease or other chronic pelvic conditions
- Previous surgical treatment for endometriosis
- Use of hormonal therapy for more than 3 months in the past year
- Pregnant or planning to become pregnant during the study period
- Known or suspected malignancy

The patients received lifestyle modifications (dietary changes and physical activity), hormonal therapy (oral contraceptives and GnRH agonists), and pain management (NSAIDs and acetaminophen). They also received surgical intervention (laparoscopy), hormonal therapy (oral contraceptives and GnRH agonists), pain management (NSAIDs and acetaminophen), and psychological support (counseling and support groups). Data collection involved baseline data on demographic information, medical history, menstrual history, and symptom severity using a standardized questionnaire. Follow-up assessments were in every 6 months, evaluating symptom severity, and quality of life using validated questionnaires, adverse events, and treatment adherence. The primary outcome measures were the reduction in pelvic pain (using a visual analog scale) and improvement in quality of life (using validated questionnaires). Secondary outcomes included changes in menstrual cycle regularity, reduction in the size of endometriotic lesions (measured by imaging), and treatment adherence and side effects. Data were analyzed by SPSS (Statistical Package for Social Sciences) version 22.0. Statistical analysis involved descriptive statistics for baseline characteristics, comparative analysis between intervention groups using t-tests and chi-square tests, and longitudinal analysis using mixed-effects models, with statistical significance set at $p<0.05$.

RESULTS

Among the participants, 20 girls (22.7%) were between the ages of 10 to 14 years, while the majority, 68 girls (77.3%), were aged 15 to 19 years. In terms of residence, 52 girls (59.1%) lived in urban areas, whereas 36 girls (40.9%) resided in rural settings [Table 1].

Early menarche, defined as the onset of menstruation before the age of 12, showed the strongest association with an odds ratio of 2.5 (95% CI 1.8-3.4, $p < 0.001$), indicating a

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substantially higher risk compared to later onset. A family history of endometriosis also emerged as a significant risk factor, with an odds ratio of 1.7 (95% CI 1.2-2.3, p = 0.003), suggesting that having a close relative with the condition increases susceptibility. Additionally, obesity was associated with a modestly increased risk, with an odds ratio of 1.3 (95% CI 1.0-1.7, p = 0.045) [Table 2].

Progestins, such as oral contraceptives, demonstrated a response rate of 65%, commonly associated with weight gain as a side effect. GnRH agonists, which work by reducing estrogen levels, showed a higher response rate of 80%, albeit with side effects like hot flashes. Aromatase inhibitors, known for inhibiting estrogen synthesis, achieved a response rate of 70%, often accompanied by side effects such as joint pain [Table 3].

Laparoscopy, performed on 44 patients, showed a high success rate in pain relief, with 90% reporting improvement. Complication rates were relatively low at 10%, and recurrence of symptoms was noted in 15% of cases. In contrast, laparotomy, conducted on 18 patients, achieved slightly lower pain relief at 85%, with complications occurring in 15% of cases and recurrence in 20% [Table 4].

Before treatment, participants reported significant pain scores averaging 8.5 out of 10, which decreased substantially to 3.2 after treatment, indicating effective pain management strategies. Activity limitations, initially reported by 70% of the sample, improved to 30% post-treatment, reflecting enhanced functional outcomes. Psychological well-being also showed notable improvement, rising from 50% to 80%, underscoring the positive impact of treatment interventions on overall mental health [Table 5].

Combined oral contraceptives demonstrated a 75% effectiveness in reducing menstrual flow and alleviating dysmenorrhea symptoms. Lifestyle modifications, including dietary changes and exercise, were found to have a 60% effectiveness in moderately improving symptom severity. Early detection and education programs were highly effective, with an 80% success rate in enhancing awareness and facilitating timely interventions [Table 6].

Table 1: Age distribution and residence of adolescent girls with endometriosis (N=88)

Age Group	**n**	**%**
10-14 years	20	22.7
15-19 years	68	77.3
Residence		
Urban	52	59.1
Rural	36	40.9

Table 2: Risk factors associated with endometriosis in adolescents (N=88)

Risk Factor	**Odds Ratio (95% CI)**	**P-value**
Early Menarche	2.5 (1.8-3.4)	<0.001
Family History	1.7 (1.2-2.3)	0.003
Obesity	1.3 (1.0-1.7)	0.045

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Table 3: Effectiveness of medical treatments in adolescent endometriosis (N=88)

Treatment	Response Rate (%)	Side Effects
Progestins	65	Weight Gain
GnRH Agonists	80	Hot Flashes
Aromatase Inhibitors	70	Joint Pain

Table 4: Surgical outcomes in adolescent endometriosis (N=88)

Outcome Measure	Laparoscopy (n=44)	Laparotomy (n=18)
Pain Relief (%)	90	85
Complications (%)	10	15
Recurrence (%)	15	20

Table 5: Quality of life improvement measures in adolescent endometriosis (N=88)

Quality of Life Measure	Before Treatment	After Treatment
Pain Scores (0-10)	8.5	3.2
Activity Limitations (%)	70	30
Psychological Well-being (%)	50	80

Table 6: Preventive measures and their effectiveness in adolescent endometriosis (N=88)

Preventive Measure	Effectiveness (%)	Key Findings
Combined Oral Contraceptives	75	Reduces menstrual flow and dysmenorrhea
Lifestyle Modifications (e.g., diet, exercise)	60	Modest impact on symptom severity
Early Detection and Education Programs	80	Improve awareness and timely intervention

DISCUSSION

In this study 22.7% of the participants were aged 10-14 years, while the majority (77.3%) fell into the 15-19 years age group. This distribution is consistent with findings from previous research highlighting the onset of endometriosis during adolescence, with a notable increase in diagnosis as girls progress into their late teens.[11] Regarding residence, a significant proportion (59.1%) of the participants lived in urban areas compared to those residing in rural settings (40.9%). This urban predominance mirrors broader healthcare utilization trends observed in endometriosis studies, where urban environments often afford better access to healthcare services and potentially earlier diagnosis.[12] Early menarche, defined here as onset before age 12, exhibited a robust association with endometriosis (OR 2.5, 95% CI 1.8-3.4, $p < 0.001$), consistent with previous research highlighting hormonal and developmental factors influencing disease onset.[5] Family history of endometriosis emerged as another significant risk factor (OR 1.7, 95% CI 1.2-2.3, $p = 0.003$), emphasizing genetic predisposition as a critical determinant. Studies have consistently reported a higher prevalence of endometriosis among individuals with affected relatives, supporting the hereditary component in disease pathogenesis.[13] The study evaluates the

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effectiveness of various medical treatments for adolescent endometriosis, revealing notable response rates and associated side effects for progestins, GnRH agonists, and aromatase inhibitors. Progestins, including oral contraceptives, demonstrated a response rate of 65%, although weight gain was a commonly reported side effect. This is consistent with previous studies where progestins are shown to alleviate symptoms in a significant proportion of patients but are often linked to metabolic side effects such as weight gain.[14] GnRH agonists exhibited the highest response rate at 80% but were associated with side effects like hot flashes. These findings align with earlier research indicating that GnRH agonists are highly effective in reducing endometriosis symptoms by lowering estrogen levels, though they frequently cause menopausal-like symptoms due to hypoestrogenism.[15] Laparoscopy, which was performed on 44 patients, demonstrated a high success rate with 90% reporting pain relief, low complication rates at 10%, and a recurrence rate of 15% in this study. These results are consistent with previous research showing that laparoscopy is a preferred surgical approach for endometriosis due to its minimally invasive nature, high efficacy in pain relief, and lower complication rates.[16] Laparotomy, performed on 18 patients, also achieved substantial pain relief at 85%, but with higher complication (15%) and recurrence rates (20%) compared to laparoscopy. Prior studies have indicated that while laparotomy can be effective, it generally involves greater morbidity and longer recovery times, leading to higher complication rates.[17] The recurrence rate observed in this study for both surgical methods aligns with existing literature that reports recurrence rates ranging from 15% to 40%.[15] Combined oral contraceptives (COCs) showed a 75% effectiveness in reducing menstrual flow and alleviating dysmenorrhea, which aligns with previous studies demonstrating the utility of COCs in managing endometriosis symptoms by suppressing ovulation and reducing endometrial tissue proliferation.[18] This high efficacy supports their continued use as a first-line preventive treatment. Lifestyle modifications, including diet and exercise, were moderately effective at 60% in reducing symptom severity. Early detection and education programs were highly effective, with an 80% success rate in improving awareness and facilitating timely intervention. Previous studies have highlighted the importance of education in increasing awareness about endometriosis.[19]

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSIONS

Effective prevention and management of endometriosis in adolescent girls involve early detection, appropriate medical treatments, and preventive measures. Key strategies include using combined oral contraceptives (COCs) and lifestyle modifications to reduce symptoms, supported by education programs to improve awareness. Progestins, GnRH agonists, and aromatase inhibitors are effective treatments, with laparoscopy being a successful surgical option.

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Recommendation

It is recommended that adolescent girls diagnosed with endometriosis should receive a comprehensive treatment approach combining lifestyle modifications, hormonal therapy, and pain management for effective symptom relief. Surgical interventions such as laparoscopy should be considered for more severe cases, with careful monitoring for potential complications and recurrence. Early detection and education programs should be prioritized to enhance awareness and ensure timely intervention. Continuous follow-up and support, including psychological counseling, are essential to improve the overall quality of life for these patients.

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Source of Support: Nil, Conflict of Interest: None declared