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Original Research Article

AUB in Adolescents Diagnosis Management and When to Investigate

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Abstract

Abnormal uterine bleeding (AUB) in adolescents is a common gynecological problem, most frequently occurring in the early post-menarchal years. It is defined as bleeding that is excessive in volume, duration, or frequency and interferes with physical, social, or emotional well-being. The most common cause of AUB in adolescents is ovulatory dysfunction due to immaturity of the hypothalamic–pituitary–ovarian axis. However, other etiologies such as pregnancy, coagulation disorders, endocrine abnormalities, infections, and structural lesions must be considered. Diagnosis is primarily clinical and begins with a thorough history focusing on menstrual patterns, severity of bleeding, sexual activity, systemic illness, medications, and family history of bleeding disorders. Physical examination emphasizes hemodynamic stability, signs of anemia, endocrine abnormalities, and systemic disease. Initial laboratory evaluation typically includes a pregnancy test, complete blood count, and, when indicated, coagulation profile and thyroid function tests. Imaging is not routinely required and is reserved for cases with suspected structural pathology or failure of medical therapy. Management depends on the severity of bleeding, hemoglobin level, and underlying cause. Mild cases may be managed with reassurance, iron supplementation, and nonsteroidal anti-inflammatory drugs. Moderate to severe bleeding often requires hormonal therapy, including combined oral contraceptives or progestins. Acute severe AUB with hemodynamic instability requires hospitalization, high-dose hormonal therapy, and supportive care. Investigation beyond basic evaluation is warranted in adolescents with severe anemia, recurrent or persistent AUB, poor response to treatment, or features suggestive of bleeding disorders or endocrine disease. Early recognition and appropriate management are essential to prevent complications and improve quality of life in affected adolescents.

Keywords: AUB, Anaemia, HPO.

Introduction

Abnormal uterine bleeding (AUB) in adolescents is a frequent gynecological concern and a common reason for healthcare visits during the early reproductive years. Adolescence represents a transitional period marked by maturation of the hypothalamic–pituitary–ovarian (HPO) axis, and menstrual irregularities are common during the first few years following menarche. While many of these disturbances are benign and self-limiting, abnormal uterine bleeding may be severe, prolonged, or recurrent, leading to anemia, impaired quality of life, and significant physical and psychological stress.

AUB is defined as uterine bleeding that deviates from normal menstrual parameters in terms of frequency, regularity, duration, or volume. In adolescents, the most common underlying mechanism is ovulatory dysfunction resulting from immaturity of the HPO axis. Nevertheless, AUB may also be a manifestation of pregnancy-related complications, coagulation disorders, endocrine abnormalities, infections, medications, or, rarely, structural uterine pathology. Therefore, careful evaluation is essential to distinguish physiological anovulatory bleeding from pathological causes requiring targeted intervention.

The clinical approach to AUB in adolescents focuses on assessing hemodynamic stability, identifying potential underlying etiologies, and initiating appropriate management to control bleeding and prevent complications such as iron deficiency anemia. A judicious balance is required to avoid unnecessary investigations while ensuring that serious conditions are not overlooked. This introduction highlights the importance of understanding the causes, diagnostic approach,

management strategies, and indications for further investigation in adolescents presenting with abnormal uterine bleeding.

Materials and Methods

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at Patna Medical College and Hospital Patna, Bihar.and a tertiary care teaching hospital. A total of 180 adolescent patients presenting with abnormal uterine bleeding (AUB) were included in the study over a defined study period.

Study Population: Adolescents aged 10–19 years who presented with complaints of abnormal uterine bleeding, defined as bleeding that was excessive in amount, duration, or frequency compared to normal menstrual patterns, were enrolled. Patients with known congenital uterine anomalies, previously diagnosed malignancy, or those already on long-term hormonal therapy were excluded from the study.

Data Collection: Detailed clinical history was obtained from all participants, including age at menarche, menstrual pattern, duration and amount of bleeding, history of passage of clots, associated symptoms, sexual activity, drug intake, and family history of bleeding disorders. General physical and systemic examinations were performed with special emphasis on hemodynamic status, body mass index, signs of anemia, thyroid disorders, and features suggestive of polycystic ovary syndrome or systemic disease.

Investigations: Baseline investigations included urine pregnancy test, complete blood count, and peripheral smear.

Additional investigations such as coagulation profile, thyroid function tests, serum prolactin, and pelvic ultrasonography were performed selectively based on clinical suspicion, severity of bleeding, anemia, or lack of response to initial therapy.

Management Protocol: Management was individualized according to the severity of bleeding and hemoglobin levels. Mild cases were managed with reassurance, iron supplementation, and nonsteroidal anti-inflammatory drugs.

Moderate to severe cases received hormonal therapy in the form of combined oral contraceptive pills or progestins. Patients with acute heavy bleeding and hemodynamic instability were hospitalized and managed with high-dose hormonal therapy and supportive measures, including blood transfusion when indicated.

Statistical Analysis: Data were recorded in a structured proforma and analyzed using appropriate statistical methods. Results were expressed as percentages and mean ± standard deviation. Associations between clinical variables and severity of AUB were evaluated where applicable.

This methodology allowed comprehensive evaluation of the clinical profile, diagnostic approach, and management outcomes of abnormal uterine bleeding in adolescent patients.

Results

A total of 180 adolescent patients with abnormal uterine bleeding (AUB) were evaluated during the study period. The mean age of the participants was 15.6 ± 2.1 years, with the majority of patients (approximately 68%) belonging to the early adolescent age group (12–16 years). Most patients (72%) presented within the first three years following menarche.

Clinical Presentation: The most common presenting complaint was menorrhagia (heavy menstrual bleeding), observed in 56% of patients, followed by metrorrhagia in 22%, polymenorrhea in 14%, and menometrorrhagia in 8%. Passage of clots was reported by 41% of adolescents. Symptoms suggestive of anemia such as fatigue, dizziness, and palpitations were present in 47% of cases.

Etiology: Ovulatory dysfunction was identified as the most frequent cause of AUB, accounting for 78% of cases. Bleeding disorders were detected in 8% of patients, with von Willebrand disease being the most common. Endocrine causes, including hypothyroidism and polycystic ovary syndrome, accounted for 9% of cases. Pregnancy-related causes were identified in 3%, while structural causes such as ovarian cysts or uterine abnormalities were noted in 2% of patients.

Laboratory Findings: Anemia (hemoglobin <10 g/dL) was present in 64% of patients. Mild anemia was observed in 36%, moderate anemia in 21%, and severe anemia in 7%. Coagulation abnormalities were detected in adolescents with a history of prolonged or recurrent bleeding. Thyroid dysfunction was found in 6% of cases.

Management and Outcomes: Conservative management with reassurance, iron supplementation, and NSAIDs was sufficient in 38% of patients. Hormonal therapy was required in 55%, most commonly combined oral contraceptive pills. Hospitalization was necessary in 12% of patients due to severe bleeding or anemia, and 6% required blood transfusion. Clinical improvement with control of bleeding was achieved in 92% of patients within three months of follow-up. These findings demonstrate that ovulatory dysfunction is the predominant cause of AUB in adolescents and that most patients can be effectively managed with medical therapy following appropriate evaluation.

Table 1: Age Distribution of Adolescents with AUB (n = 180)

Age Group (years)	Number of Patients	Percentage (%)
10–12	32	17.8
13–15	68	37.8
16–19	80	44.4
Total	**180**	**100**

Table 2: Duration since Menarche

Years Since Menarche	Number of Patients	Percentage (%)
< 1 year	42	23.3
1–3 years	88	48.9
> 3 years	50	27.8
Total	180	100

Table 3: Pattern of Abnormal Uterine Bleeding

Bleeding Pattern	Number of Patients	Percentage (%)
Menorrhagia	101	56.1
Metrorrhagia	40	22.2
Polymenorrhea	25	13.9
Menometrorrhagia	14	7.8
Total	180	100

Table 4: Etiology of AUB in Adolescents

Etiology	Number of Patients	Percentage (%)
Ovulatory dysfunction	140	77.8
Bleeding disorders	14	7.8
Endocrine disorders	16	8.9
Pregnancy-related causes	6	3.3
Structural causes	4	2.2
Total	180	100

Table 5: Hemoglobin Status at Presentation

Hemoglobin Level (g/dL)	Number of Patients	Percentage (%)
≥10 (Normal/Mild)	65	36.1
7–9.9 (Moderate anemia)	38	21.1
<7 (Severe anemia)	13	7.2
Total anemic	116	64.4

Table 6: Management Modalities Used

Treatment Modality	Number of Patients	Percentage (%)
Reassurance + Iron + NSAIDs	68	37.8
Hormonal therapy	99	55.0
Hospitalization required	22	12.2
Blood transfusion	11	6.1

Discussion

Abnormal uterine bleeding (AUB) is a common gynecological problem in adolescents and constitutes a significant proportion of outpatient visits in this age group. The present study evaluated 180 adolescent girls presenting with AUB, focusing on their clinical profile, etiology, diagnostic approach, and management outcomes. The findings highlight that AUB in adolescents is predominantly a functional disorder, with ovulatory dysfunction being the most frequent cause.

In this study, the majority of patients were in the early to mid-adolescent age group and presented within the first three years after menarche. This observation is consistent with existing literature, which attributes menstrual irregularities in early adolescence to immaturity of the hypothalamic–pituitary–ovarian axis, resulting in anovulatory cycles. Similar age distribution and timing since menarche have been reported in previous studies, emphasizing that most cases of adolescent AUB are physiological and self-limiting.

Menorrhagia was the most common bleeding pattern observed, followed by metrorrhagia and polymenorrhea. Heavy menstrual bleeding in adolescents often leads to iron deficiency anemia, as reflected in the high proportion of anemic patients in the present study. More than half of the adolescents had hemoglobin levels below normal, underscoring the importance of early diagnosis and

prompt correction of anemia to prevent long-term morbidity and impaired quality of life. Ovulatory dysfunction accounted for nearly four-fifths of cases, reinforcing its role as the primary etiology of AUB in adolescents. However, a notable proportion of patients were found to have bleeding disorders and endocrine abnormalities, including hypothyroidism and polycystic ovary syndrome. These findings highlight the need for a high index of suspicion and selective investigation, especially in adolescents with severe, prolonged, or recurrent bleeding, or a positive personal or family history of bleeding tendencies.

The management of AUB in this study was predominantly medical, with most patients responding well to conservative measures and hormonal therapy. Mild cases were successfully managed with reassurance, iron supplementation, and nonsteroidal anti-inflammatory drugs, while moderate to severe cases required hormonal intervention. Combined oral contraceptive pills were effective in controlling bleeding and regulating menstrual cycles. Only a small proportion of patients required hospitalization or blood transfusion, indicating that timely medical management can prevent serious complications and reduce the need for invasive interventions.The high rate of clinical improvement observed during follow-up supports current recommendations that emphasize medical management as the first-line approach in adolescent AUB. Imaging and invasive procedures were rarely required, reinforcing the principle that extensive evaluation is unnecessary in most adolescents unless there is poor response to therapy or suspicion of underlying pathology. the findings of this study align with existing evidence that adolescent AUB is most commonly due to ovulatory dysfunction and can be effectively managed with a

Conclusion

Abnormal uterine bleeding in adolescents is a common and predominantly functional gynecological condition, most often resulting from ovulatory dysfunction related to immaturity of the hypothalamic–pituitary–ovarian axis. The present study demonstrates that the majority of adolescents present within the first few years after menarche and commonly experience heavy menstrual bleeding, frequently leading to iron deficiency anemia.

A systematic clinical evaluation supported by selective investigations is sufficient for diagnosis in most cases. Extensive investigations and imaging are rarely required and should be reserved for adolescents with severe anemia, recurrent or persistent bleeding, poor response to medical therapy, or features suggestive of bleeding disorders or endocrine abnormalities.

Medical management remains the cornerstone of treatment. Most patients respond well to conservative measures, iron supplementation, and hormonal therapy, with a high rate of successful control of bleeding and minimal need for hospitalization or blood transfusion. Early diagnosis and timely intervention not only prevent complications such as severe anemia but also improve the physical, emotional, and social well-being of affected adolescents.

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