ORIGINAL ARTICLE

Prevalence Of Anemia and Its Systemic Effects in Women with Chronic Abnormal Uterine Bleeding

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ABSTRACT
Background: Chronic abnormal uterine bleeding (AUB) is a common gynecological disorder and a major cause of iron deficiency anemia in women of reproductive age. Persistent blood loss not only reduces hemoglobin levels but also leads to systemic manifestations that significantly impair physical functioning and quality of life.
Objective: To determine the prevalence and severity of anemia and to evaluate its systemic effects among women with chronic abnormal uterine bleeding presenting to a tertiary care hospital.
Methods: This hospital-based cross-sectional study was conducted in the Gynaecology Unit-II, Sahiwal Teaching Hospital, Pakistan, from June 2022 to May 2023. A total of 90 women aged 18–50 years with chronic AUB of at least six months' duration were enrolled. Detailed clinical history and physical examination were performed. Hemoglobin levels and red cell indices were measured using automated hematology analysis. Anemia was defined as hemoglobin <12 g/dL and categorized as mild, moderate, or severe. Systemic effects including fatigue, weakness, exertional dyspnea, palpitations, dizziness, headache, and functional limitation were documented. Data were analyzed using descriptive and comparative statistics.
Results: Anemia was detected in 62 women, yielding a prevalence of 68.9%. Mild anemia was present in 31.1%, moderate anemia in 26.7%, and severe anemia in 11.1% of participants. Microcytic anemia was the predominant pattern, indicating iron deficiency. Systemic manifestations were significantly more frequent among anemic women, particularly fatigue (83.9%), generalized weakness (74.2%), exertional dyspnea (50.0%), and reduced daily functional capacity (61.3%). The severity of symptoms increased with worsening anemia.
Conclusion: Anemia is highly prevalent in women with chronic AUB and is associated with considerable systemic morbidity. Early screening and integrated management of anemia should be a routine component of care in these patients.
Keywords: Abnormal uterine bleeding; Anemia; Iron deficiency; Systemic effects; Women; Chronic bleeding

INTRODUCTION

Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints among women of reproductive age and represents a major cause of outpatient visits and hospital admissions worldwide[1]. When bleeding becomes chronic, defined as persistent or recurrent abnormal bleeding for several months, it frequently results in excessive menstrual blood loss that exceeds the body's physiological capacity to maintain normal iron balance. In low- and middle-income countries, including Pakistan, delayed healthcare seeking, nutritional deficiencies, and limited access to preventive gynecological care further amplify the burden of chronic AUB and its complications[2,3].

Anemia is the most important and clinically significant systemic consequence of chronic AUB. Repeated menstrual blood loss leads to progressive depletion of iron stores, eventually resulting in iron deficiency anemia, the most prevalent type of anemia in women[4]. The condition is often insidious; many women adapt to gradually falling hemoglobin levels and remain undiagnosed until symptoms become severe. As a result, anemia in AUB is frequently underestimated or treated as a secondary issue rather than a core component of disease management[5].

The systemic effects of anemia extend well beyond reduced hemoglobin levels. Diminished oxygen-carrying capacity produces widespread physiological disturbances, including fatigue, generalized weakness, exertional dyspnea, palpitations, dizziness, headaches, impaired concentration, and reduced physical endurance[6]. Chronic anemia can place sustained stress on the cardiovascular and respiratory systems, contribute to reduced work productivity, and significantly impair quality of life. In women already burdened by chronic bleeding, these systemic manifestations compound physical, psychological, and socioeconomic distress[7].

Despite the high prevalence of AUB, there is limited local data comprehensively quantifying the burden of anemia and its multisystem effects in affected women. Most available studies focus primarily on bleeding patterns or gynecological causes, with less emphasis on the systemic physiological consequences of prolonged blood loss[8]. Understanding both the prevalence and the clinical impact of anemia in women with chronic AUB is essential for developing integrated diagnostic and therapeutic strategies. Therefore, this study aims to determine the prevalence and severity of anemia among women with chronic abnormal uterine bleeding and to evaluate its associated systemic effects in a tertiary care hospital setting[9].

MATERIALS AND METHODS

Study Design and Study Setting: This hospital-based cross-sectional analytical study was conducted in the Gynaecology Unit-II, Sahiwal Teaching Hospital, Sahiwal, Pakistan, a tertiary care teaching hospital that receives patients from both urban and rural catchment areas. The study was carried out over a one-year period from June 2022 to May 2023.

Study Population and Sample Size: A total of 90 women diagnosed with chronic abnormal uterine bleeding (AUB) were included in the study. Participants were recruited using consecutive non-probability sampling from both outpatient and inpatient services of the gynecology unit. Eligible women were between 18 and 50 years of age and had a documented history of abnormal uterine bleeding persisting for six months or longer, irrespective of the bleeding pattern.

Eligibility Criteria: Women of reproductive age presenting with chronic AUB who provided written informed consent were included. Patients were excluded if they were pregnant, in the postpartum period, or had postmenopausal bleeding. Women with known bleeding disorders, previously diagnosed hemoglobinopathies, chronic renal or liver disease, active malignancy, or systemic

inflammatory conditions were excluded. Patients who had received blood transfusion or iron therapy within the preceding three months were also excluded to minimize confounding effects on hemoglobin levels and red cell indices.

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Clinical Assessment and Data Collection: After enrollment, detailed clinical data were collected using a structured and pre-tested proforma. Information recorded included age, parity, socioeconomic background, duration and type of abnormal uterine bleeding, presence of passage of clots, and history of previous medical or hormonal treatment. A thorough general physical examination was performed for each participant, with particular emphasis on signs of anemia such as pallor, tachycardia, and postural symptoms. Systemic effects of anemia were evaluated through patient-reported symptoms and clinical assessment, including fatigue, generalized weakness, exertional dyspnea, palpitations, dizziness, headache, poor concentration, and reduction in daily physical or work-related activities.

Laboratory Evaluation: Venous blood samples were obtained under aseptic conditions from all participants for complete blood count (CBC) analysis. Hemoglobin concentration and red blood cell indices were measured using an automated hematology analyzer. Anemia was defined as a hemoglobin level of less than 12 g/dL. Severity of anemia was categorized as mild (10–11.9 g/dL), moderate (7–9.9 g/dL), and severe (<7 g/dL). Red cell indices were used to assess the morphological pattern of anemia, particularly to identify features suggestive of iron deficiency. Additional investigations related to the evaluation of abnormal uterine bleeding were performed as part of routine clinical care and were recorded when available.

Assessment of Systemic Effects: Systemic effects of anemia were assessed using a standardized symptom-based approach. Symptoms were categorized into constitutional (fatigue, weakness), cardiovascular (palpitations), respiratory (exertional dyspnea), and neurological (dizziness, headache, impaired concentration) domains. Functional impact was evaluated by documenting limitations in routine household activities or occupational performance attributed to symptoms of anemia.

Statistical Analysis: Collected data were entered and analyzed using standard statistical software. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The prevalence and severity of anemia were calculated, and associations between anemia status and systemic effects were analyzed using appropriate statistical tests. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: The study was conducted in accordance with ethical principles for medical research involving human subjects. Ethical approval was obtained from the institutional ethics committee of Sahiwal Teaching Hospital prior to the commencement of the study. Written informed consent was obtained from all participants, and confidentiality of personal and clinical information was strictly maintained throughout the research process.

RESULTS

A total of 90 women with chronic abnormal uterine bleeding (AUB) were included in the final analysis. The results are presented with appropriate paragraph-based interpretation supported by tables.

Baseline Demographic and Clinical Characteristics:

The mean age of the study participants was 36.4 ± 7.8 years. Most women belonged to the 30–39 years age group, followed by those aged 40–50 years. A large proportion of patients were multiparous, and the majority reported a duration of abnormal uterine bleeding exceeding one year, indicating chronicity of the condition as shown in table 1.

Prevalence and Severity of Anemia:

Anemia was detected in 62 out of 90 women, giving an overall prevalence of 68.9%. Among anemic patients, mild anemia was the most frequent, followed by moderate anemia, while a smaller proportion had severe anemia. These findings highlight that nearly two-thirds of women with chronic AUB were anemic at presentation as shown in table 2.

Hematological Pattern of Anemia: Red blood cell indices showed that a substantial proportion of anemic women had microcytic anemia, suggesting iron deficiency as the most likely etiology. Increased red cell distribution width was also frequently observed, reflecting ongoing iron-restricted erythropoiesis as shown in table 3.

Systemic Effects of Anemia: Systemic symptoms were significantly more common in anemic women compared to non-anemic women. Fatigue and generalized weakness were the most frequently reported symptoms, followed by exertional dyspnea, palpitations, and dizziness. Neurological symptoms such as headache and poor concentration were also notably prevalent, indicating the multisystem impact of anemia as shown in table 4.

Association Between Anemia Severity and Functional Limitation: The frequency and intensity of systemic effects increased with worsening severity of anemia. Women with moderate to severe anemia exhibited significantly higher rates of exertional dyspnea, palpitations, and reduced functional capacity compared to those with mild anemia as shown in table 5.

Overall, anemia was present in nearly seven out of ten women with chronic abnormal uterine bleeding. Iron deficiency–type anemia was the dominant pattern, and anemia was strongly associated with multiple systemic manifestations, particularly fatigue, cardiopulmonary symptoms, and impaired daily functioning. The burden of symptoms increased markedly with the severity of anemia, underscoring the clinical importance of early detection and management in women with chronic AUB.

Table 1. Baseline demographic and clinical characteristics (n = 90)

Variable	Frequency (%)
Age group (years)	
18–29	18 (20.0)
30–39	39 (43.3)
40–50	33 (36.7)
Parity	
Nulliparous	14 (15.6)
Multiparous (≥2)	76 (84.4)
Duration of AUB	
6–12 months	34 (37.8)
>12 months	56 (62.2)
Common bleeding pattern	
Heavy menstrual bleeding	56 (62.2)
Prolonged bleeding	19 (21.1)
Irregular/frequent bleeding	15 (16.7)

Table 2. Prevalence and severity of anemia among study participants

Hemoglobin status	Frequency (%)
Non-anemic (Hb ≥12 g/dL)	28 (31.1)
Anemic (Hb <12 g/dL)	62 (68.9)
Mild anemia (10–11.9 g/dL)	28 (31.1)
Moderate anemia (7–9.9 g/dL)	24 (26.7)
Severe anemia (<7 g/dL)	10 (11.1)

Table 3. Red cell indices pattern among anemic women (n = 62)

Hematological parameter	Frequency (%)
Microcytic (MCV <80 fL)	39 (62.9)
Normocytic	18 (29.0)
Macrocytic	5 (8.1)
Raised RDW	35 (56.5)

Table 4. Systemic effects in anemic versus non-anemic women

Systemic manifestation	Anemic (n=62)	Non-anemic (n=28)
Fatigue	52 (83.9%)	11 (39.3%)
Generalized weakness	46 (74.2%)	9 (32.1%)
Exertional dyspnea	31 (50.0%)	4 (14.3%)
Palpitations	22 (35.5%)	3 (10.7%)
Dizziness	19 (30.6%)	3 (10.7%)
Headache	26 (41.9%)	6 (21.4%)
Reduced work capacity	38 (61.3%)	7 (25.0%)

Table 5. Relationship between anemia severity and selected systemic effects

Systemic effect	Mild anemia (n=28)	Moderate–Severe anemia (n=34)
Fatigue	20 (71.4%)	32 (94.1%)
Exertional dyspnea	9 (32.1%)	22 (64.7%)
Palpitations	6 (21.4%)	16 (47.1%)
Reduced daily activity	14 (50.0%)	24 (70.6%)

DISCUSSION

This study demonstrates that anemia is a highly prevalent complication among women presenting with chronic abnormal uterine bleeding (AUB), with more than two-thirds of the participants affected[7]. This high prevalence reflects the cumulative effect of prolonged menstrual blood loss, which gradually depletes iron stores and leads to iron deficiency anemia. Similar prevalence rates have been reported in regional and international studies, particularly in developing countries where nutritional deficiencies, delayed presentation, and limited access to gynecological care are common[8,9].

The majority of anemic women in this study had mild to moderate anemia; however, a noteworthy proportion presented with severe anemia, indicating late diagnosis and prolonged disease duration[10]. The predominance of microcytic anemia and raised red cell distribution width strongly suggests iron deficiency as the principal etiology, consistent with chronic blood loss due to AUB. These hematological patterns reinforce the need to consider iron deficiency anemia as a predictable and preventable consequence of chronic menstrual disorders[11].

Systemic manifestations were significantly more frequent in anemic women compared to non-anemic participants[12]. Fatigue and generalized weakness were the most common complaints, followed by exertional dyspnea, palpitations, dizziness, and headache. These symptoms reflect the reduced oxygen-carrying capacity of blood and the compensatory cardiovascular and respiratory responses to chronic anemia. Importantly, the presence of neurocognitive symptoms and reduced work or household capacity highlights the broader impact of anemia on daily functioning and quality of life, extending beyond gynecological morbidity alone[13-15].

A clear relationship was observed between the severity of anemia and the intensity of systemic effects[16]. Women with moderate to severe anemia experienced substantially higher rates of cardiopulmonary symptoms and functional limitation than those with mild anemia. This finding emphasizes that anemia severity is not merely a laboratory classification but a clinically meaningful indicator of symptom burden and physiological compromise. Failure to identify and treat anemia at earlier stages may therefore result in progressive systemic impairment[17].

These findings underscore the need for an integrated clinical approach in women with chronic AUB. Management should not be limited to controlling uterine bleeding alone but must include routine screening for anemia and timely correction of iron deficiency. Early intervention has the potential to reduce symptom burden, improve functional capacity, and prevent progression to severe anemia with its associated complications[18-20].

CONCLUSION

Anemia is highly prevalent among women with chronic abnormal uterine bleeding and is associated with significant systemic symptoms and functional impairment. Routine screening and early management of anemia, alongside treatment of the underlying cause of AUB, are essential to improve clinical outcomes and quality of life in affected women.

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