Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2013; 1(1): 1191-1195 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2013.v01i06.0111
Received: 17-10-2013, Accepted: 05-12-2013, Published: 31-12-2013

Research Article

Anemia and Its Severity in Women with Dysfunctional Uterine Bleeding

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Abstract: ***Background:*** Anemia remains a significant public health problem among women with dysfunctional uterine bleeding (DUB), resulting in adverse health outcomes. This data helps understand the condition's seriousness and prevalence for early intervention. This study evaluated anemia in patients with DUB for prevalence, severity, and relation to menstrual blood loss and iron status. ***Methods:*** This cross-sectional observational study was conducted from January 2010 to December 2011 at the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, among 120 women diagnosed with DUB. Serum hemoglobin, ferritin, iron, and total iron-binding capacity (TIBC) were assessed. A pictorial blood assessment chart (PBAC) estimated menstrual blood loss. Statistical analyses were done by SPSS (version 21.0). ***Results:*** Anemia was found in 82.5% of participants, with moderate anemia (38.3%) being the most common, followed by mild (28.3%) and severe anemia (15.8%). Patients with excessive menstrual blood loss (>150 mL) had significantly lower hemoglobin, serum ferritin, and serum iron levels, which inversely correlated with anemia severity. TIBC was elevated in severely anemic women (352.8 ± 21.5 µg/dL), indicating increased iron requirement. ***Conclusion:*** Women with DUB Exhibit High Prevalence of Anemia: A Descriptive Study. Importance: There is a high prevalence of anemia in women with dysfunctional uterine bleeding (DUB). Strategies including early identification, pharmacy management and menstrual regulation will improve reproductive health outcomes.
Keywords: Anemia, Dysfunctional uterine bleeding, Hemoglobin, Iron status, Menstrual blood loss.

INTRODUCTION

Abnormal bleeding in women, known as Dysfunctional Uterine Bleeding (DUB), affects many individuals and reduces their health and quality of life [1]. Anemia is the most dangerous secondary condition of DUB because iron-deficiency anemia develops due to prolonged blood loss [2]. Identifying the rate of occurrence alongside anemia severity among women who experience DUB represents a priority for managing their conditions and achieving better results.

Medical professionals define anemia as a decline in red blood cell levels or hemoglobin terms, which reduces blood oxygen transport capacity [3]. Iron deficiency anemia is the most frequently occurring worldwide because of continuous blood loss. The heavy menstrual bleeding patterns of DUB cause substantial iron loss that creates the risk of anemia in these patients [4]. The signs of fatigue, weakness, and diminished exercise capability frequently appear in patients, which harms their daily routines and total health state [5].

The importance of this issue becomes clear through existing research findings. Scientific research shows menstrual blood loss causes decreased iron storage in the body, which requires sufficient iron consumption to stop anemia development [6]. Research indicates that between 10–30% of menstruating women fail to maintain adequate iron levels, and approximately one-third develop anemia, as per a review analysis [7]. The prevalence of anemia among female members of Bangladesh's population remains high, according to studies, which showed that 74% of individuals were anemic in 1995-96 [8]. Investigations show that iron requirements among menstruating women differ significantly because many females do not reach their daily iron requirements, thus increasing their chance of developing anemia [9].

Few existing studies provide concrete measurements regarding anemia severity within the population of women suffering from DUB. The majority of research studies analyze heavy menstrual bleeding generically while failing to treat DUB as an isolated condition [10]. Varying diagnostic methods used for DUB and anemia measurement, together with inconsistent study approaches, create conflicting interpretations in reported intensity as well as frequency distribution. The existing research gap prevents the development of population-specific interventions that could support this particular group of patients.

This study aims to determine how prevalent and severe anemia becomes in women who have DUB. Our research suggests that women with DUB should be evaluated for moderate to severe anemia since many of them need specialized medical treatment due to these blood conditions. Our study aims to connect DUB with anemia levels so healthcare professionals can develop better patient care through early intervention, which will improve treatment results.

OBJECTIVE

The objective of this study was to evaluate the prevalence and severity of anemia among women with dysfunctional uterine bleeding.

This cross-sectional observational study was conducted at the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January 2010 to December 2011. A total of 120 women with dysfunctional uterine bleeding are included in this study.

Selection criteria:

Inclusion Criteria:

- Women aged 18–50 years diagnosed with DUB.
- Patients with regular or irregular menstrual cycles.
- Patients who provided informed consent for participation.

Exclusion Criteria:

- Women with known hematological disorders.
- Patients with chronic systemic diseases affecting hemoglobin levels.
- Pregnant or postpartum women.
- Patients receiving iron supplements or blood transfusions in the past three months.
- Women with a history of malignancy or recent surgery.

Data collection

Information was gathered through structured interviews, clinical assessments, and laboratory tests. A standardized questionnaire was used to document demographic and clinical information, such as menstrual history and socioeconomic background. Hemoglobin levels were determined using an automated hematology analyzer, while serum ferritin, serum iron, and total iron-binding capacity (TIBC) were evaluated through biochemical tests. Menstrual blood loss was gauged using the pictorial blood assessment chart (PBAC). All participants provided informed consent, ensuring confidentiality and compliance with ethical research standards.

Statistical data analysis

Data analysis was conducted using SPSS (version 21.0). Descriptive statistics were employed to summarize demographic information, anemia prevalence, and iron levels. Continuous data were represented as mean ± standard deviation, while categorical variables were shown as frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Sociodemographic Characteristics of Women with Dysfunctional Uterine Bleeding (n=120)

Characteristic		Frequency (n)	Percentage (%)
Age (years)	≤ 20	19	15.8
	21–30	43	35.8
	31–40	31	25.8
	41–50	17	14.2
	> 50	10	8.3
Marital Status	Married	84	70
	Unmarried	36	30
Education Level	No formal education	37	30.8
	Primary	46	38.3
	Secondary	26	21.7
	Higher	11	9.2
Employment Status	Employed	33	27.5
	Unemployed	47	39.2
	Homemaker	40	33.3
Socioeconomic Status	Low	56	46.7
	Middle	41	34.1
	High	23	19.2

Table 1 details the sociodemographic profile of the study group (n=120). The largest age group was 21–30 years, comprising 35.8% of participants, followed by those aged 31–40 at 25.8%. A significant portion were

married (70%) and had completed primary education (38.3%), while 30.8% had not received formal education. Employment varied, with 39.2% unemployed, 33.3% homemakers, and 27.5% employed. Socioeconomic status was 46.7% low, 34.1% middle, and 19.2% high.

Table 2: Prevalence of Anemia in Women with Dysfunctional Uterine Bleeding

Anemia Severity	Number of Patients (N=120)	Percentage (%)
Severe Anemia	19	15.8
Moderate Anemia	46	38.3
Mild Anemia	34	28.3
No Anemia	21	17.5

Table 2 shows the prevalence of anemia among women with DUB, with 82.5% affected. Moderate anemia was most prevalent, at 38.3%, followed by mild at 28.3% and severe at 15.8%. Only 17.5% were not anemic.

Table 3: Hemoglobin Status by Anemia Severity

Anemia Severity	Mean Hemoglobin (g/dL) ± SD	Range (g/dL)
Severe Anemia	6.5 ± 0.9	<7
Moderate Anemia	9.3 ± 0.8	7.0-9.9
Mild Anemia	10.2 ± 0.4	10.0-10.4
No Anemia	13.2 ± 0.5	>10.4

Table 3 shows the hemoglobin levels according to the severity of anemia. Women with severe anemia had a mean hemoglobin of 6.5±0.9 g/dL, and those with moderate anemia had a mean of 9.3±0.8 g/dL. Those with mild anemia had a mean hemoglobin level of 10.2 ± 0.4 g/dL; those without anemia 13.2 ± 0.5 g/dL.

Table 4: Relationship Between Menstrual Blood Loss and Anemia Severity

Menstrual Blood Loss (mL)	No Anemia (n=21)	Mild Anemia (n=34)	Moderate Anemia (46)	Severe Anemia (n=19)
<80	21 (100.0)	25 (73.53)	17 (36.96)	0 (0.0)
80-150	0 (0.0)	9 (26.47)	24 (52.17)	5 (26.32)
>150	0 (0.0)	0 (0.0)	5 (10.87)	14 (73.68)

Table 4 explores the link between menstrual blood loss and anemia severity. Participants with blood loss under 80 mL had either no anemia (100%) or mild anemia (73.53%). More significant blood loss correlated with more severe anemia. Among those losing 80–150 mL, 52.17% had moderate anemia, and 26.32% had severe anemia. Notably, 73.68% of women with blood loss over 150 mL experienced severe anemia, highlighting a strong connection between excessive blood loss and anemia severity.

Table 5: Iron Status in Women with Dysfunctional Uterine Bleeding by Anemia Severity (n=120)

Iron Parameter	No Anemia (n=21)	Mild Anemia (n=34)	Moderate Anemia (46)	Severe Anemia (n=19)
Serum Ferritin (µg/L)	54.5±6.1	35.1±5.5	18.4±4.3	10.1±3.2
Serum Iron (µg/dL)	101.2±9.7	81.3±10.6	45.7±8.1	26.5±6.7
Total Iron Binding Capacity	276.1±16.5	324.6±20.1	341.5±18.4	352.8±21.5

Table 5 outlines iron status parameters by anemia severity. Women with severe anemia had the lowest serum ferritin levels (10.1 ± 3.2 µg/L), followed by those with moderate (18.4 ± 4.3 µg/L) and mild anemia (35.1 ± 5.5 µg/L). Non-anemic individuals had the highest mean serum ferritin (54.5 ± 6.1 µg/L). Serum iron levels decreased with anemia severity, from 101.2 ± 9.7 µg/dL in non-anemic women to 26.5 ± 6.7 µg/dL in those with severe anemia. Total iron-binding capacity (TIBC) showed an inverse pattern, peaking in severely anemic women (352.8 ± 21.5 µg/dL), indicating increased iron demand.

DISCUSSION

The present study assessed the prevalence and severity of anemia among women with dysfunctional uterine bleeding (DUB) and explored the relationship between menstrual blood loss and iron status. Our findings indicate that anemia is highly prevalent in this population, with 82.5% of women exhibiting some anemia. Moderate anemia (38.3%) was the most common, followed by mild (28.3%) and severe (15.8%) anemia. These findings align with previous studies reporting a high burden of anemia among women with DUB.

The results from our study validate previous research which demonstrated a connection between DUB and anemia. The Fraser et al. survey showed that 80% of women with menorrhagia displayed low hemoglobin levels, which fit with our study results [11]. According to Hallberg and Nilsson, excessive menstrual blood loss above 80 mL was the primary cause of iron deficiency anemia in premenopausal women [12]. Our research confirmed that every woman with more than 150 mL blood loss experienced moderate or severe anemia thus validating the established cause-effect connection. Our study shows a different anemia prevalence ratio than Cote et al., who reported 60% anemia cases in their research population [13]. Studies display varying rates of anemia because their target populations differ, as do dietary iron consumption and healthcare services.

Our study's high occurrence of anemia resulted from prolonged menstrual bleeding that depleted patients' iron stores. Women who experienced severe anemia showed lower serum ferritin indicators of 10.1 ± 3.2 µg/L when compared to women without anemia who had 54.5 ± 6.1 µg/L. According to Milman et al., menorrhagia's severity clearly correlates with serum ferritin depletion levels [14]. Research conducted by Van den Broek et al. and Beard proved that iron deficiency constitutes the main reason for anemia in women of reproductive age thus supporting our study findings [15, 16].

The biological cause of iron deficiency anemia develops when prolonged negative iron balance occurs because iron absorption remains lower than iron losses. Anemia in women leads to increases in total iron-binding capacity (TIBC), according to measurements reported in medical research [17]. TIBC reached its maximum value of (352.8 ± 21.5 µg/dL) during severe anemia cases because of elevated iron requirements. The pathophysiology of anemia linked to DUB depends on the disruption of iron homeostasis, as observed in these findings.

Anemia severity shows different intensity levels because individual regenerative responses among blood cells and nutritional diet elements contribute to this phenomenon. Women who take sufficient iron through their diet or supplements tend to have reduced anemia severity even when their blood volume decreases significantly. Study findings show different anemia prevalence rates because researchers use different hemoglobin values for diagnosis and conduct measurements using various assessment methods. WHO sets non-pregnant female anemia diagnosis at hemoglobin levels below 12 g/dL, yet some investigations use lower thresholds, thereby affecting their observed prevalence estimates [18].

These research results present significant implications for clinical practice. Women with DUB experience anemia, which leads to fatigue, poor work productivity and diminished quality of life. Severe cases of anemia may result in cardiac problems that require immediate treatment. The results of our research demonstrate an ongoing requirement for systematic anemia verification and immediate treatment of anemic patients with DUB to avoid severe health problems. Healthcare providers need to identify people who are at high risk so they can implement both iron-based supplements and menstrual regulation treatments.

Implementing menstrual healthcare education with anemia prevention programs as part of healthcare policy will help reduce this financial pressure. Healthcare organizations should prioritise iron supplementation programs for women who experience heavy menstrual bleeding (HMB). Hemoglobin and ferritin tests provided at the point of care within gynecology clinics can help doctors diagnose anemia during its early stages. The findings presented by Clark et al. demonstrate that dietary interventions effectively decrease anemia prevalence rates thus offering public health programs a potential foundation [19].

CONCLUSION

This research underscores a significant occurrence of anemia among women experiencing dysfunctional uterine bleeding, with moderate anemia being the most prevalent. A notable link between increased menstrual blood loss and reduced hemoglobin and iron levels was found. These results add to the expanding evidence on anemia in women of reproductive age, highlighting the importance of early detection and treatment. Clinically, it is essential to prioritize regular blood assessments and targeted iron supplementation. Raising awareness and implementing preventive measures in healthcare settings can help alleviate the impact of anemia. Tackling anemia in this group is crucial for enhancing overall reproductive health outcomes.

Limitations of the study

The limitations of this study include its relatively small sample size, which may limit the generalizability of the results. The use of self-reported data for menstrual blood loss could introduce recall bias, and the study did not account for variations in dietary intake. Future research should focus on conducting larger, multicenter longitudinal studies to identify causal relationships and evaluate long-term outcomes. Emphasizing standardized, objective methods for measuring menstrual blood loss and iron status is crucial. Integrating routine anemia screening into gynecological care could improve early detection and management, thereby enhancing reproductive health outcomes.

Acknowledgment

I would like to express my sincere gratitude for the invaluable support and cooperation provided by the staff, participants, and my co-authors/colleagues who contributed to this study.

Financial support and sponsorship: *No funding sources.*

Conflicts of interest: *There are no conflicts of interest.*

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