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Abnormal Uterine Bleeding as the Presenting Symptom of Hematologic Cancer

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Abstract

OBJECTIVE—To estimate the percentage of women with a hematologic cancer who present with abnormal uterine bleeding.

METHODS—We performed a retrospective analysis of the records of women with hematologic malignancies treated at our institution from January 2002 through January 2016. Women with abnormal uterine bleeding as the chief presenting symptom were identified.

RESULTS—Of the 10,682 women with hematologic malignancies, 38 had abnormal uterine bleeding as their chief presenting complaint. These women were young (median age of 34 years), premenopausal, and otherwise healthy. The top four additional presenting complaints were fatigue, dyspnea or shortness of breath, bruising or petechiae, and fever with means (95% confidence interval) of 58% (41%–74%), 42% (26%–59%), 42% (26%–59%), and 24% (11%–40%), respectively. The complete blood count upon initial presentation with abnormal uterine bleeding revealed that 33 (87%) women had anemia (mean hemoglobin level of 8.6 g/dl) and 34 (89%) had thrombocytopenia (mean platelet count of 81 k/μl). Twelve (32%) women had neutropenia, eight (21%) women had normal white blood cell counts, and 18 (47%) women had leukocytosis. Thirty three women (87%) were diagnosed with acute leukemia, one with myelodysplastic syndrome (3%) and four (11%) with chronic leukemia.

CONCLUSIONS—We estimate the incidence of abnormal uterine bleeding as the chief presenting symptom is 3.6 cases per 1,000 women with hematologic cancer. These young, otherwise healthy women who present with acute, new-onset heavy menstrual bleeding in conjunction with thrombocytopenia or pancytopenia should be referred to hematology for evaluation of possible hematologic malignancy.

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INTRODUCTION

Abnormal uterine bleeding (AUB), defined as menstrual bleeding of abnormal length, quantity, or timing, is common, affecting up to 30% of all US women prior to menopause.^{1–3} AUB can have several potential etiologies, which require evaluation before the actual cause is identified.

The most common causes of AUB are structural, including endometrial polyps, adenomyosis, leiomyoma, and solid malignancy, all of which can be identified on imaging studies or endometrial biopsy. The least common but more elusive causes of AUB are nonstructural, including coagulopathy and ovulatory disorders, which require laboratory evaluation to determine the diagnosis. Coagulopathies can present with AUB as well as gingival or nasal bleeding.^{4–6} While hematologic cancer in particular is a rare form of coagulopathy leading to AUB, current literature does not define the clinical features or laboratory findings that are suggestive of hematologic cancer. Furthermore the true frequency of AUB as a presenting symptom of hematologic malignancy is not known.

For this reason, we have conducted a retrospective study to better define this frequency, as well as the associated patient characteristics.

MATERIALS AND METHODS

We retrospectively reviewed the electronic medical records of all females aged 13 years and above diagnosed with hematologic cancer and concomitant AUB from January 1, 2002, through January 1, 2016. Patients were identified using coding from the International Classification of Disease, Ninth Revision (ICD-9). University of Texas MD Anderson Cancer Center Institutional review board approval was obtained under a waiver of informed consent.

Bioinformatics searched the electronic medical record using 121 hematologic malignancy ICD-9 codes, then subsequently narrowed down these results with 9 AUB ICD-9 codes, shown in Table 1. The resulting charts were manually reviewed for the chief complaint leading to the diagnosis of malignancy, an event that was typically documented in the initial patient note. Initial complete blood count (CBC) results indicating a coagulopathy were either documented in the initial note from the outside facility or present in the laboratory results from their initial blood draw at our institution.

Electronic medical records were reviewed for age, race, ethnicity, menopausal status, gynecologic history, duration and description of AUB before diagnosis, medical history of major diagnoses, hematologic diagnosis, mortality status, chief and accompanying symptoms, first documented CBC at presentation, and the type of facility or physician evaluating the patient. Patients were excluded due to: the timing of AUB not coinciding with the diagnosis of hematologic malignancy, care limited to consultation, incomplete medical records, incorrect hematologic diagnosis, lack of AUB documentation, prior hysterectomy with bleeding limited to spotting, unavailable laboratory data, lymphoma of an isolated body part treated by surgical resection, and other.

Premenopausal status was defined as age $\leq$ 51 years along with occurrence of menstrual bleeding. Menopausal status was initially defined by age cut-off and confirmed by chart review. Hematologic cancers were defined as leukemia, lymphoma, and myelodysplastic syndrome. Descriptive statistics, including frequencies, percentages, means, and ranges, were obtained. In addition, Fisher exact tests were performed on the symptoms data to assess differences between patients who were AUB at presentation and an equally sized random sample of patients who were not AUB at presentation. All statistical analysis was performed using SAS 9.4 (SAS institute, Cary, NC). Data was maintained in a REDCap database.⁷

RESULTS

A total of 10,682 women with hematologic cancer were identified, of whom 714 had AUB, and 9,968 did not (Figure 1). Of these 714 women with AUB, 258 were excluded based on: the timing of AUB not coinciding with the diagnosis of hematologic malignancy (25%), care limited to consultation (24%), incomplete medical records (12%), incorrect hematologic diagnosis (8%), lack of AUB documentation (8%), prior hysterectomy with bleeding limited to spotting (6%), unavailable laboratory data (3%), lymphoma of an isolated body part treated by surgical resection (3%), and other (9%).

This exclusion left the charts of 456 women available for our analysis, of which 400 were premenopausal and 56 were postmenopausal. Of the 400 premenopausal women, 37 presented with AUB. The remaining 363 patients experienced AUB during their hematologic cancer treatment. Of the 56 postmenopausal women, one presented with AUB. The remaining 55 experienced AUB during their treatment for hematologic cancer. In total, 38 women presented with AUB as the chief complaint leading to the diagnosis of a hematologic malignancy, and 37 of these patients were premenopausal and 1 patient was postmenopausal (Figure 1). Overall, 38 of 10,682 women diagnosed with a hematologic cancer (3.6/1,000) had presenting symptoms of AUB.

Demographic data, gynecologic and medical histories, hematologic diagnoses, and mortality data for these 38 women are summarized in Table 2. The mean age at diagnosis in this group of 38 women was 34 years. Overall, 33 women (87%) had one or no past medical diagnoses. Most of the women (23/38, or 61%) had no past medical history diagnosis. Ten (26%) patients had one past medical diagnosis including: one with asthma, one with diabetes, one with HIV, one with Crohn disease, one with depression, one with chronic obstructive pulmonary disease, two with migraine headaches, and two with hypertension. Five (13%) patients had more than one diagnosis, including: one with HIV and pneumocystis pneumonia, one with nephrolithiasis and a urinary tract infection, one with asthma, hypertension, and dyslipidemia, one with asthma, hypertension, and bronchitis, and one with depression and hypothyroidism. One of the two patients with HIV was diagnosed with acute myeloid leukemia (AML), and the other was diagnosed with acute lymphoblastic leukemia (ALL).

All 38 patients had a diagnosis of leukemia (n=37) or myelodysplastic syndrome (MDS) (n=1), no cases of lymphoma were found (Table 2). Of the 37 patients with leukemia, 33

patients had acute leukemia: 20 with AML, six with ALL, and seven with acute promyelocytic leukemia (APL). Chronic myelogenous leukemia (CML) was seen in three patients, and chronic lymphoblastic leukemia (CLL) in one.

Following the onset of severe AUB, 30 of 38 patients, (78%) sought care during their first episode of AUB. Eight women (22%) waited to address their AUB: two women presented in the second month of AUB, two in the third month, one in the fourth month, and three in the sixth month.

CBC parameters upon initial presentation to the emergency center or physician are reported in Table 3. Hematologic malignancy was suspected in all 38 women on the basis of the CBC results. All diagnoses were later confirmed with bone marrow biopsies. Most of the women (87%) had anemia (the mean hemoglobin level for all 38 was 8.6 g/dl), while 30 (80%) women had moderate (8–10.9 g/dl) or severe anemia (< 8 g/dl). Thirty-four (89%) women had thrombocytopenia (mean platelet count for all 38 was 81 k/μl), while 12 women had severe thrombocytopenia, with platelet counts below 25 k/μl. Excluding one patient who had thrombocytosis (initial platelet count of 1172 k/μl, which is considered extremely rare), the mean platelet count for the remaining 37 was 53 k/μl. Twelve (32%) women had neutropenia, eight (21%) women had normal white blood cell counts, and 18 (47%) women had leukocytosis. The mean white blood cell count for all 38 women was 35.3 k/μl with a range from 0.4 to 300 k/μl.

Overall, 24 (63%) patients had abnormal values for all three parameters including hemoglobin, hematocrit and platelet count. Fourteen patients had one or more normal values: twelve had one normal value and two patients had two normal values (patients 1 and 2), as shown in Table 4. Of these, patients 1–5 had normal hemoglobin, patients 6 and 7 had normal platelet counts, and patients 8–14 had normal WBC values.

Seventeen (45%) women presented to an emergency center, 10 (26%) women presented to their gynecologists, and 11 (29%) women presented to their primary care physicians.

All 38 women described AUB that was new in onset. Their bleeding was described as profound and acute, significantly heavier than their normal flow, and often accompanied by menstrual clotting. The four most common additional symptoms were fatigue (58%), dyspnea or shortness of breath (42%), bruising or petechiae (42%), and fever (24%), as shown in Table 5. Nine (24%) women had other forms of bleeding, including five (13%) women with gingival bleeding and four (11%) women with epistaxis (one woman had both gingival bleeding and epistaxis). The comparison sample of 38 women who had AUB, but did not present with it, experienced fatigue (39%), bone or joint pain (37%), weakness (18%), and fever (18%), as their top four symptoms.

Of these 38 women who presented with AUB, 14 (37%) have died. Five died within 1 year of the diagnosis, six died 1–3 years after the diagnosis, two died between 3–5 years after the diagnosis, and one died after five years from diagnosis (Table 2). Nine patients had AML, four had ALL, and 1 had CML. All deaths were due to complications of the hematologic cancer.

DISCUSSION

We estimate that the incidence of AUB as the chief presenting symptom is 3.6 per 1,000 women with hematologic cancer, a frequency not previously reported. Current national guidelines recommend a CBC for all women with prolonged or heavy menstrual bleeding,^{8, 9} which typically may reveal anemia. In our study patients, anemia was often seen, but it was also accompanied by profound thrombocytopenia and neutropenia or leukocytosis. Evidence of these hematologic findings should prompt referral to a hematologist in order to expedite the probable diagnosis of a hematologic malignancy.

The majority of the women with hematologic cancer and concomitant AUB were young, (mean age of 34 years) and otherwise healthy, a profile that lowers the suspicion of serious disease. However, each patient described her AUB as abrupt or new in onset, and significantly heavier than in previous, normal cycles. On the contrary, the 72 years old postmenopausal patient described her bleeding as spotting. The unusually heavy bleeding seen in these patients was likely due to the profound thrombocytopenia,¹⁰ with over 68% of them having a platelet count of <50 k/μl, placing them at risk for severe, life-threatening hemorrhage.⁵ Furthermore, thrombocytopenia can cause epistaxis and gingival bleeding, (9/38 patients), as well as petechiae and bruising (16/38 patients).

Mild fatigue is a common symptom in general; however, shortness of breath coupled with severe fatigue can indicate a more serious condition, such as acute anemia. In fact, 22 patients with shortness of breath and severe fatigue had moderate or severe anemia. All 38 patients in our study had acute onset uterine bleeding, AUB lasting less than six months, contributing to their anemia. In conjunction with AUB, these signs and symptoms of thrombocytopenia and anemia should warrant further evaluation for the presence of a bleeding disorder.^{11, 12}

Timely diagnosis of hematologic cancer is crucial. Twenty four of our patients had abnormal values for all three laboratory values including hemoglobin, WBC, and platelet counts. The differential diagnosis of 1) pancytopenia (anemia, thrombocytopenia, and neutropenia) or 2) anemia, thrombocytopenia, and leukocytosis includes hematologic malignancy, HIV (related to direct viral transformation)¹³, and a number of smaller reported associations. The presence of blast (immature) cells on the peripheral smear, seen in many of our patients, is indicative of hematologic malignancy.¹⁵ Furthermore, neutropenia with an absolute neutrophil count (ANC) of less than two, in the absence of chemotherapy, can also be indicative of hematologic malignancy.

A more difficult scenario emerges when one or more of these lab values are normal, which occurred in 14 of our patients (Table 4). One of the two patients with 2 normal values (Hg of 12.9 g/dl, platelet count of 155 k/μl), also had an extremely elevated WBC (140 k/μl), which would warrant a repeat CBC. Conversely, the other patient had a normal Hg and WBC count, but a low platelet count (58 k/μl). This thrombocytopenia should also trigger a repeat CBC. Patient 10 presents the most difficult scenario due to only minimally abnormal values. She had a Hg of 9.7 g/dl, a platelet count of 119 k/μl, (both abnormal, but not severe), and a normal WBC at 6.1 k/μl. Additional diagnostic recommendations include: a review of the

peripheral blood smear, elucidation of additional symptoms, and referral for persistent abnormal values, even if only minimally abnormal.

Only a few case reports have described patients with AUB and associated symptoms, leading to a subsequent diagnosis of hematologic malignancy.^{16–20} The current 5-year survival rate for AML is 26% and for ALL is 70%.²¹ Fourteen of the women (37%) in our study have died to date indicating the lethality of these cancers.

A strength of our study is the large patient pool. Our hematology-oncology department treats patients with new and refractory cases from a multistate radius. However, the retrospective nature of the chart review is a weakness. A better delineation of AUB would likely result in the identification of a greater diversity of characteristics that may be indicative of hematologic cancer, but the rarity of this presentation limits prospective analysis.

It is important to understand the hematologic profile and symptoms in women with AUB, who are ultimately diagnosed with hematologic cancer, in order to better recognize this life-threatening condition so that prompt treatment may occur. We estimate the incidence of abnormal uterine bleeding as the chief presenting symptom is 3.6 cases per 1,000 women with hematologic cancer. These young, otherwise healthy women who present with acute, new-onset heavy menstrual bleeding in conjunction with thrombocytopenia or pancytopenia should be referred to hematology for evaluation of possible hematologic malignancy.

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References

1. Liu Z, Doan QV, Blumenthal P, Dubois RW. A systematic review evaluating health-related quality of life, work impairment, and health-care costs and utilization in abnormal uterine bleeding. *Value Health*. 2007 May-Jun;10(3):183–94. [PubMed: 17532811]
2. Matteson KA, Raker CA, Clark MA, Frick KD. Abnormal uterine bleeding, health status, and usual source of medical care: analyses using the Medical Expenditures Panel Survey. *Journal of women's health* 2002. 2013 Nov; 22(11):959–65.
3. Singh S, Best C, Dunn S, Leyland N, Wolfman WL, Leyland N, et al. Abnormal uterine bleeding in pre-menopausal women. *J Obstet Gynaecol Can*. 2013 May; 35(5):473–9. [PubMed: 23756279]
4. Munro MG, Critchley HO, Broder MS, Fraser IS. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. *Int J Gynaecol Obstet*. 2011 Apr; 113(1):3–13. [PubMed: 21345435]
5. Ewenstein BM. The pathophysiology of bleeding disorders presenting as abnormal uterine bleeding. *Am J Obstet Gynecol*. 1996 Sep; 175(3 Pt 2):770–7. [PubMed: 8828560]
6. Practice bulletin no. 128: diagnosis of abnormal uterine bleeding in reproductive-aged women. *Obstet Gynecol*. 2012 Jul; 120(1):197–206. [PubMed: 22914421]
7. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) - A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009; 42(2):377–81. [PubMed: 18929686]
8. American College of Obstetricians and Gynecologists. ACOG committee opinion no. 557: management of abnormal uterine bleeding in nonpregnant reproductive-aged women. *Obstet Gynecol*. 2013; 121(4):891–6. [PubMed: 23635706]

9. The Society of Obstetricians and Gynaecologists of Canada. Clinical Practical Guidelines 292: Abnormal uterine bleeding in pre-menopausal women. 2013
10. Quass AM, Ginsburg ES. Prevention and treatment of uterine bleeding in hematologic malignancy. *Eur J Obstet Gynecol Reprod Biol.* 2007; 134(1):3–8. [PubMed: 17467142]
11. Demers C, Derzko C, David M, Douglas J. Gynaecological and obstetric management of women with inherited bleeding disorders. *J Obstet Gynaecol Can.* 2005; 27(7):707–32. [PubMed: 16100628]
12. James AH, Kouides PA, Abdul-Kadir R, Edlund M, Federici AB, Halimeh S, et al. Von Willebrand disease and other bleeding disorders in women: consensus on diagnosis and management from an international expert panel. *Am J Obstet Gynecol.* 2009; 201(1):12, e1–8. [PubMed: 19481722]
13. Karcher DS, Frost AR. The bone marrow in human immunodeficiency virus (HIV)-related disease. Morphology and clinical correlation. *Am J Clin Pathol.* 1991; 95(1):63–71. [PubMed: 1702927]
14. Vardiman JW, Thiele J, Arber DA, Brunning RD, Borowitz MJ, Porwit A, et al. The 2008 revision of the World Health Organization (WHO) classification of myeloid neoplasms and acute leukemia: rationale and important changes. *Blood.* 2009; 114(5):937–51. [PubMed: 19357394]
15. Bain BJ. Diagnosis from the blood smear. *N Engl J Med.* 2005; 353(5):498–507. [PubMed: 16079373]
16. Joshi SK, Purandare SM, Desaiha. Profuse vaginal bleeding due to leukemia. *J Postgrad Med.* 1962 Jul.8:116–9. [PubMed: 14452550]
17. Blaicher W, Jager U. Abnormal vaginal bleeding as first symptom of acute leukemia. *Arch Gynecol Obstet.* 2001 Mar; 265(1):55–6. [PubMed: 11327097]
18. Wasson M, Hochman M, Cadungog M. Postmenopausal Bleeding Resulting from Acute Myeloid Leukemia Infiltration of the Endometrium. *Del Med J.* 2015; 87(7):212–5. [PubMed: 26285320]
19. Alperin M1, Quaas A, Johnson NR, Hornstein MD. Endometrial ablation in a woman with a persistent uterine hemorrhage due to acute promyelocytic leukemia: a case report. *J Reprod Med.* 2007; 52(6):548–50. [PubMed: 17694980]
20. Henes M1, Nauth A, Staebler A, Becker S, Henes JC. Postmenopausal bleeding as first sign of an acute myelogenous leukaemia: A case report and review of the literature. *Med Oncol.* 2010; 27(3): 815–9. [PubMed: 19763918]
21. 76 American Cancer Society. Cancer Facts & Figures. 2016. Available at: <http://www.cancer.org/acs/groups/content/@research/documents/document/acspc-047079.pdf>

Figure 1.

Selection of patients with hematologic cancer and abnormal uterine bleeding (AUB).

*Patients were excluded due to: timing of AUB not coinciding with the diagnosis of hematologic malignancy, care limited to consultation, incomplete medical records, incorrect hematologic diagnosis, lack of AUB documentation, prior hysterectomy with bleeding limited to spotting, unavailable laboratory data, lymphoma of an isolated body part treated by surgical resection, and other (non-repetitive reasons).

Table 1

International Classification of Disease, Ninth Revision (ICD-9) Codes

ICD-9 Codes	Categorical Diagnosis	Description of Diagnosis	# codes
626.1	Abnormal	Scanty Menstruation	1
626.2	Uterine	Excessive Menstruation	1
626.4	Bleeding	Irregular Menstruation	1
626.5		Ovulation bleeding	1
626.6		Metrorrhagia	1
626.9		Menstrual disorder NOS	1
627		Premenopausal menorrhagia	1
627.1		Postmenopausal bleeding	1
627.7		Post-coital bleeding	1
Total			9
200.2–200.28	Malignancy	Burkitt's Tumor or Lymphoma	9
200.4–200.48		Mantle Cell Lymphoma	9
200.6–200.68		Anaplastic Large Cell Lymphoma	9
200.7–200.78		Large Cell Lymphoma	9
202.8–202.88		Other Malignant Lymphomas	9
203.1–203.12		Plasma Cell Leukemia	3
204–204.02		Acute Lymphoid Leukemia	3
204.2–204.22		Sub-acute Lymphoid Leukemia	3
204.8–204.82		Other Lymphoid Leukemia	3
204.9–204.92		Unspecified Lymphoid Leukemia	3
205–205.02		Acute Myeloid Leukemia	3
205.2–205.22		Sub-acute Myeloid Leukemia	3
205.8–205.82		Other Myeloid Leukemia	3
205.9–205.92		Unspecified Myeloid Leukemia	3
206–206.02		Acute Monocytic Leukemia	3
206.1–206.11		Chronic Monocytic Leukemia	2
206.2–206.22		Sub-acute Monocytic Leukemia	3
206.8–206.82		Other Monocytic Leukemia	3
206.9–206.92		Unspecified Monocytic Leukemia	3
207–207.02		Acute Erythremia And Erythroleukemia	3
207.2–207.22		Megakaryocytic Leukemia	3
207.8–207.82		Other specified leukemia	3
208–208.02		Leukemia of unspecified cell type	3
208.2–208.22		Sub-acute Leukemia unspecified cell type	3
208.8–208.82		Other Leukemia of unspecified cell type	3
208.9–208.92		Unspecified Leukemia	3
V10.6		Personal History of Leukemia	1
V10.69		Personal History Of Other Leukemia	1
V10.61		Personal History Of Lymphoid Leukemia	1

ICD-9 Codes	Categorical Diagnosis	Description of Diagnosis	# codes
V10.62		Personal History Of Myeloid Leukemia	1
V10.63		Personal History Of Monocytic Leukemia	1
Total			121

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Table 2**Demographics and Clinical Characteristics (N=38)**

Characteristic	Value
Age, mean (range)	34 years (14–73 years)
Gynecologic history, median (range)	
Gravidity	2 (0–6)
Parity	1 (0–5)
Race/ethnicity, no. (%)	
Caucasian	18 (47.4%)
Hispanic	12 (31.6%)
African American	7 (18.4%)
Asian or Pacific Islander	1 (2.6%)
Past Medical History, no. (%)	
No diagnoses	23 (60.5%)
1 diagnosis	10 (26.3%)
>1 diagnosis	5 (13.2%)
Hematologic malignancy, no. (%)	
Acute Myeloid Leukemia	20 (52.6%)
Acute Lymphoblastic Leukemia	6 (15.8%)
Acute Promyelocytic Leukemia	7 (18.4%)
Myelodysplastic Syndrome	1 (2.6%)
Chronic Myelogenous Leukemia	3 (7.9%)
Chronic Lymphoblastic Leukemia	1 (2.6%)
Duration (months) of AUB at time of hematologic cancer diagnosis, no. (%)	
First	30 (78.9%)
Second	2 (5.3%)
Third	2 (5.3%)
Fourth	1 (2.6%)
Sixth	3 (7.9%)
Time from diagnosis of hematologic malignancy to death, no. (%)	
<1 year	5 (36%)
1–3 years	6 (43%)
3–5 years	2 (14%)
5–9 years	1 (7%)

Table 3**Complete Blood Count Parameters (N=38)**

Parameter	Value
Hemoglobin level (g/dl)	
Mean (range)	8.6 (2.8–13.7)
Normal (12–16), no. (%)	5 (13.2%)
Abnormal (<12 or >16), no. (%)	33 (86.8%)
Mild anemia (11–11.9), no. (%)	3 (7.9%)
Moderate anemia (8–10.9), no. (%)	16 (42.1%)
Severe anemia (<8), no. (%)	14 (36.8%)
Platelet count (k/μl)	
Mean (range)	81.4 (1–1172)
Normal (140–440), no. (%)	3 (7.9%)
Abnormal (<140 or >440), no. (%)	35 (92.1%)
Thrombocytopenia (50–140), no. (%)	8 (21.1%)
Thrombocytopenia (<50), no. (%)	15 (39.5%)
Severe thrombocytopenia (<25), no. (%)	11 (29.0%)
Thrombocytosis (>440), no. (%)	1 (2.6%)
White blood cell count (k/μl)	
Mean (range)	35.3 (0.4–300)
Normal (4–11), no. (%)	8 (21.1%)
Neutropenia (<4), no. (%)	12 (31.6%)
Leukocytosis (>11), no. (%)	18 (47.4%)

Table 4

Initial CBC Results with a Normal Value (N=14)

Patient	Hemoglobin (12–16 g/dl)	Platelets (140–440 k/μl)	White Blood Cell Count (4–11 k/μl)
1	12.9 *	155 *	140
2	13.4 *	58	5.7 *
3	13.7 *	47	127
4	12.1 *	31	78
5	12 *	1172	41
6	9.7	175 *	300
7	10.6	371 *	111
8	5.9	13	5.7 *
9	9.5	28	10.4 *
10	9.7	119	6.1 *
11	9.8	83	4.5 *
12	11.6	5	7.1 *
13	11.8	38	5.7 *
14	8.6	46	5.4 *

* Normal values are in bold with an asterisk

Table 5

Presenting Signs and Symptoms

Finding	Abnormal Uterine Bleeding at Presentation				
	Present (N=38)		Not Present (N=38)		p-value [/]
	Percent	95% CI	Percent	95% CI	
Abnormal uterine bleeding	100%	91% – 100%	0%	0%–9%	<.001
Fatigue	58%	41% – 74%	39%	24% – 57%	0.168
Bruising or petechiae	42%	26% – 59%	13%	4% – 28%	0.009
Dyspnea or shortness of breath	42%	26% – 59%	8%	2% – 21%	0.001
Fever	24%	11% – 40%	18%	8% – 34%	0.779
Nausea or vomiting	13%	4% – 28%	13%	4% – 28%	1.000
Gingival bleeding	13%	4% – 28%	8%	2% – 21%	0.711
Cough or sore throat	13%	4% – 28%	5%	1% – 18%	0.430
Dizziness	11%	3% – 25%	13%	4% – 28%	1.000
Weight loss	11%	3% – 25%	8%	2% – 21%	1.000
Bone or joint pain	11%	3% – 25%	37%	22% – 54%	0.014
Epistaxis	11%	3% – 25%	0%	0%–9%	0.115
Weakness	8%	2% – 21%	18%	8% – 34%	0.309
Tender lymph nodes	5%	1% – 18%	5%	1% – 18%	1.000
Night sweats	5%	1% – 18%	5%	1% – 18%	1.000
Flu-like symptoms	3%	0% – 14%	11%	3% – 25%	0.358
Other	58%	41% – 74%	47%	31% – 64%	0.491

[/] Fisher's Exact Test