Original Study

Treatment of Acute Abnormal Uterine Bleeding in Adolescents: What Are Providers Doing in Various Specialties?

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A B S T R A C T

Study Objective: The purpose of this study was to assess whether variability exists in the management of acute abnormal uterine bleeding (AUB) in adolescents between pediatric Emergency Department (ED) physicians, pediatric gynecologists, and adolescent medicine specialists.
Design: Retrospective chart review.
Setting: Tertiary care medical center ED.
Participants, Interventions, and Main Outcome Measures: We included girls aged 9-22 years who presented from July 2008 to June 2014 with the complaint of acute AUB. Patients were identified using the International Classification of Diseases, ninth revision codes for heavy menstrual bleeding, AUB, and irregular menses. Exclusion criteria included pregnancy and current use of hormonal therapy. One hundred fifty patients were included.
Results: Among those evaluated, 61% (n = 92) were prescribed hormonal medication to stop their bleeding by providers from the ED, Adolescent Medicine, or Pediatric Gynecology. ED physicians prescribed mostly single-dose and multidose taper combined oral contraceptive pills (85%; n = 24), compared with Adolescent Medicine (54%, n = 7), and Gynecology (28%, n = 13). Pediatric gynecologists were more likely than ED physicians to treat patients with norethindrone acetate, either alone or in combination with a single dose combined oral contraceptive pill (61%, n = 33 vs 7%, n = 2; $P < .001$).
Conclusion: Variations in treatment strategies for adolescents who present with acute AUB exist among pediatric specialties, which reflects a lack of standardized care for adolescents. Prospective evaluation of the shortest interval to cessation of bleeding, side effects, and patient satisfaction are valuable next steps.
Key Words: Acute abnormal uterine bleeding, Adolescents, Treatment

Introduction

Abnormal uterine bleeding (AUB) might be acute or chronic and is defined as bleeding from the uterine corpus that is abnormal in regularity, volume, frequency, or duration, and occurs in the absence of pregnancy.[1] Acute uterine bleeding is defined as "an episode of bleeding in a woman of reproductive age, who is not pregnant, that, in the opinion of the provider, is of sufficient quantity to require immediate intervention to prevent further blood loss."[2] Intervention in this setting is often initiated before the completed workup for the specific etiology of AUB.[3]

Menstrual disorders are common in adolescents. Self-reported surveys have shown that 30% of adolescents report irregular bleeding and 15%-40% perceive their bleeding as abnormally heavy.[4,5] Numerous studies have shown that 50%-80% of menstrual cycles in the first 2 years after menarche are anovulatory, and create dysfunctional endometrial shedding.[6,7] Anovulatory cycles create an environment of unopposed estrogen stimulation and endometrial proliferation, without progestin-induced stabilization. The end result is disorderly shedding of the endometrial lining without prostaglandin-mediated vasoconstriction and platelet-plugging of arterioles.[8] The presence of an underlying bleeding disorder might further exacerbate the situation. Ultimately, these issues might lead to episodes of heavy vaginal bleeding, and often prompt an emergency room visit.

Medical management is generally considered first-line therapy for acute AUB and might consist of estrogen, progestin, or a combination of both, usually in the form of combined oral contraceptive pills (COCPs). Despite their widespread use, there exists very little information regarding the effectiveness, side effects, and patient satisfaction associated with these commonly used medical regimens. Even less evidence exists in the adolescent medical literature.

To our knowledge, only 1 study that compared medical intervention with placebo has been reported in the literature.[9] In this randomized controlled trial, use of intravenous conjugated equine estrogen (CEE) resulted in cessation of bleeding by 5 hours in 72% of the treatment group vs only 38% in the placebo group.[9] In all other studies, medications have been compared with each other, without a control group. In 1 randomized controlled trial, COCPs were administered with a taper and compared with oral

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progestin therapy alone, with no difference in efficacy between the 2 regimens.[10] Two additional studies describe the time to cessation of bleeding using a single oral progestin method, again without the participation of control groups, and no difference in efficacy was shown.[11,12]

We have found no studies that evaluated the long-term bleeding patterns with various hormonal regimens. Because of the lack of strong evidence to support one medical regimen over another, we sought to understand whether variability exists in workup and prescribing methods, and if so, whether it was specific to specialty.

Materials and Methods

Research Design and Study Population

This retrospective chart review was institutional review board-approved at a children's hospital in a large urban academic setting. Female patients aged 9-22 years who had been evaluated in the Emergency Department (ED) for acute AUB were included. In this study, the term. 'adolescent,' refers to girls up to the age of 22 years, which reflects the upper age limit set by Children's Hospital Colorado (CHCO) for routine patient care.

Data Collection

The CHCO Research Institute entire electronic medical record was searched for data between July 2008 and June 2014. The electronic medical record was queried for all female patients between the ages of 9 and 22 years, who presenting to the ED with acute vaginal bleeding. Cases of vaginal bleeding were identified on the basis of the following International Classification of Diseases, ninth revision codes: disorders of menstruation (626), excessive or frequent menstruation (626.2), irregular bleeding (626.4), and dysfunctional uterine bleeding (626.8). Patients with a coexisting pregnancy or currently receiving hormonal medication were excluded. A total of 419 charts were accessed and ultimately 150 met inclusion criteria.

When the initial query was performed, the Research Institute uploaded the patient list, including the patient's medical record number, age, race, and date of ED visit into a secure REDCap database. Four gynecologists then independently searched each patient's medical record for the following information pertaining to the ED visit: age at menarche, menstrual history, notes on inquiry about personal and family history of a bleeding disorder, relevant physical examination findings, including body mass index (BMI) and vital signs at presentation, laboratory findings including complete blood count (CBC) or hematocrit if a full CBC was not ordered, prothrombin time, partial thromboplastin time (PTT), and standard Von Willebrand disease testing, presence or absence of transfusion, diagnosis, medication and dosage prescribed, and finally, specialty of the provider who recommended therapy.

All patients were initially evaluated by the ED provider and then the chart was reviewed to determine whether phone consultation was obtained. The chart was then reviewed for subsequent follow-up office visits, record of time to cessation of bleeding, side effects from medication, and satisfaction with the prescribed treatment.

Throughout the process, regular meetings were held among the reviewers to maintain consistency and discuss any discrepancies in the medical record. When all charts were reviewed, the principal investigator subsequently reviewed all charts to confirm accuracy of data-gathering.

The primary outcome was treatment recommended and specialty of the prescribing physician. Secondary outcomes included rates of historical data collection, rates of laboratory evaluation, and predictors of laboratory studies ordered, criteria for blood transfusion, time to cessation of bleeding, side effects from medication, and satisfaction with the prescribed treatment.

Consistent with previous studies, we defined severe anemia as hemoglobin level less than 8 mg/dL and tachycardia as a heart rate greater or equal to 100 beats per minute.

Statistical Analyses

Descriptive statistics are presented for continuous variables using means and ranges for each clinical specialty, with Student *t* tests to compare these variables. The association between 2 categorical variables was tested using χ^2 tests, and analysis of variance was used for comparisons of more than 2 variables. When a χ^2 test was invalid because of small sample size, the Fisher exact test was used. *P* less than .05 was considered significant.

Results

A total of 150 adolescents, not receiving hormonal medication, who presented to CHCO ED with a complaint of acute AUB were included. The median age was 14.9 years (range, 9-22 years). There was no significant difference in demographic information between patients evaluated by Emergency Medicine, Pediatric Gynecology, or Adolescent Medicine (Table 1). Among the faculty providers, there were a total of 77 ED physicians, 3 pediatric gynecologists, and 5 adolescent medicine physicians who cared for these patients.

All patients were initially evaluated by ED staff, with ED providers subsequently consulting a specialty service in just more than 50% of patients. Among the adolescents not treated with medication (39%; n = 58), the ED staff managed all of them. Among those who were treated with

Table 1
Demographic Characteristics of Patients Evaluated for Acute AUB in the Emergency Department According to Specialty

Characteristic	Emergency Medicine	Pediatric Gynecology	Adolescent Medicine	Other	*P*
n	86	46	13	5	
Mean age (range), years	15.3 (9-22)	14.1 (10-19)	15.3 (11-20)	13.6 (10-18)	.170
Ethnicity, n (%)					.112
Caucasian	20 (23)	15 (33)	4 (31)	2 (40)	
African American	15 (17)	9 (20)	1 (8)	0 (0)	
Hispanic	46 (53)	16 (35)	7 (54)	2 (40)	
Other	5 (6)	6 (13)	1 (8)	1 (20)	

AUB, abnormal uterine bleeding.