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Brief Report: Von Willebrand Disease in Women: A Review and APN Survey Results

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Abstract

Approximately 3 million women in the United States are estimated to have an inherited bleeding disorder, VWD being the most common and affecting 1% of the population. Pathophysiology, prevalence, relationship to heavy menstrual bleeding, screening and appropriate workup for VWD are discussed. Advanced practice nurses were surveyed about the amount of education on bleeding disorders and revealed 59% were taught about Type 1 Von Willebrand disease in school. Furthermore, 62.2% of participants felt like their training was not sufficient for preparation on the evaluation of bleeding disorders in clinical practice.

Keywords

Bleeding disorders, Nurse practitioner, Survey, Von Willebrand disease, Education, Women's health

Introduction

Approximately 3 million women in the United States are estimated to have an inherited bleeding disorder, with von Willebrand disease (VWD) being the most common and affecting 1% of the population [1-3]. It is estimated that 20% of patients presenting for evaluation of heavy menstrual bleeding will have an underlying bleeding disorder [3,4]. Heavy menstrual bleeding is defined as menses that last longer than 7 days or result in blood loss of more than 80 mL within a single menstrual cycle [5]. The lack of awareness of different types of bleeding disorders often leads to delayed diagnosis [2]. This can have a negative impact on quality of life for patients [6,7]. Despite hormonal interventions, many women may be subjected to blood transfusions for continued symptomatic bleeding, invasive procedures or hysterectomies before a bleeding disorder is suspected [8]. In 2007, the National Heart, Lung and Blood Institute from the National Institutes of Health issued a guideline regarding the evaluation and management of VWD [1] and in 2011 issued updated materials related to VWD and hemophilia. We seek to evaluate the amount of training in bleeding disorders that Advanced Practice Nurses (APNs) in Women's Health received. This paper provides a clinical review for the evaluation of VWD and presents our survey results on a questionnaire that sought to assess the following research questions: 1) what specific training did APNs receive in the evaluation and management of bleeding disorders; and 2) how are bleeding disorders addressed in the context of dysfunctional uterine bleeding in women?

Clinical Background

Pathophysiology

VWD is caused by a genetic defect in the structure or function of a protein, von Willebrand factor (VWF), which is needed for normal blood clotting [9]. VWF works in the clot formation cascade by helping link platelets and subendothelium in an injured vessel wall [9]. It also works by transporting factor VIII, another protein that is important in clot stabilization. Absence of VWF can result in epistaxis, heavy menstrual bleeding, and bleeding complications after trauma or surgery due to impaired platelet adhesion and decreased availability of factor VIII [9,10]. Additionally, VWD is classified by quantitative or qualitative defects in VWF [1,10]. There are three major types of VWD and few more rare forms as well.

It is estimated that 70-75% of patients with VWD have Type 1 [9]. Type 1 is due to a quantitative defect and is usually characterized by mild to moderate bleeding symptoms. This type can be diagnosed by a VWF level below 30-40 IU/dL [10]. Type 1 is more commonly diagnosed in patients with Type O blood, because these individuals present with lower levels of VWF than non-blood O group individuals [9].

Type 2 VWD is a qualitative defect and represents 10-20% of all diagnoses. Patients with Type 2 can have moderate to severe bleeding [9]. Levels of VWF antigen can be decreased, elevated, or normal, but the structural or functional defects cause impaired activity [10]. Four types of Type 2 VWD exist and are diagnosed by the type of VWF dysfunction [9].

Type 3 VWD is a quantitative defect and is the rarest [11]. Patients with Type 3 often have severe bleeding symptoms due to absolute deficiency in VWF [10].

Acquired VWD is rare but is typically seen in patients with cancers such as lymphoma or leukemia and in patients with cardiovascular disease [9].

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Prevalence

VWD is reportedly present in up to 1% of the population based on epidemiological data; however, fewer individuals with VWD present to clinics complaining of bleeding problems [12]. It is estimated that VWD affects 5-24% of women with heavy menstrual bleeding [2]. VWD occurs in both sexes equally, but women tend to present with more symptoms, specifically gynecologic manifestations [9]. As expected, more severe bleeding symptoms are seen in those with a diagnosis of Types 2 or 3 VWD [9].

Gynecologic manifestations

In women with VWD 74-92% have significant heavy menstrual bleeding [2]. Symptoms patients can report include soaking through a pad or tampon in 1 hour and soiling clothes or sheets [2]. This bleeding can lead to anemia and iron deficiency [9]. Women with VWD are at an increased risk for hemorrhagic ovarian cysts, endometriosis, and uterine fibroids. In one study, females with heavy bleeding reported more pain during their cycle [5].

During pregnancy, patients with VWD are at risk for postpartum hemorrhage [9]. For patients with Type 1 VWD and for a portion of Type 2 VWD, in the second and third trimesters, levels of VWF and factor VIII increase but fall to pre-pregnancy levels upon delivery [11]. It is recommended that patients' levels be monitored antepartum, close to delivery, and postpartum. If factor VIII, VWF, and ristocetin cofactor levels are greater than 50 IU/dL, the risk of acute bleeding postpartum is minimized if large VWF multimers are normally represented [9]. Nonetheless, women should be monitored for several weeks after delivery because postpartum hemorrhage can be delayed [2].

The lack of awareness of different bleeding disorders, including VWD, often leads to delayed diagnosis [2].

Presentation

A detailed personal and family history is important to establish when it may be important to screen for VWD [5]. A bleeding disorder should be suspected if a patient has any of the following: heavy menstrual bleeding since menarche; family history of a bleeding disorder; and personal history of 1 of the following: epistaxis, ecchymosis without injury, minor wound bleeding, gingival bleeding, mucosal bleeding from the gastrointestinal tract without evidence of anatomic lesions, excessive bleeding after dental procedure, history of a blood transfusion, postpartum hemorrhage or expanding hemorrhagic cyst [2]. Bleeding symptoms can vary depending on the type of VWD a patient has [2]. In someone for whom the history is suspicious, taking detailed information about the menstrual cycle is important. A pictorial blood assessment chart (PBAC) can be useful in evaluating a patient's blood loss during menstruation. Scores over 100 are indicative of heavy menstrual bleeding [9]. A physical examination is important to look for signs of easy bruising [9]. Family history may include a family member with one or more episodes of excessive bleeding such as an obstetrical complication or nosebleeds [9].

Clinical workup

A workup for bleeding disorders including VWD should include a complete blood count, activated partial thromboplastin time, VWF, ristocetin cofactor activity and antigen, factor VIII and fibrinogen [2]. Factor VIII, VWF antigen and ristocetin cofactor levels are lowest during menstruation so testing is preferred during this time, but experts agree the workup should not be delayed [2]. Testing can also be performed while patients are taking hormonal therapy for treatment, but patients with Type 1 VWD may have normal results while on estrogen-containing hormones. Therefore, for patients dependent on hormonal therapies to control heavy menstrual bleeding, a better time to consider testing is during the placebo week, when suppressive estrogen levels from exogenous hormones are lowest. Even though one test may be helpful, a final diagnosis requires that levels fall within the established diagnostic criteria for VWD on at least 2 separate testing occasions [2]. In the situation where a patient has borderline normal VWF level (40-60 IU/dL), testing should be repeated during menstruation [2].

Treatment

Treatment of VWD can be complex, and working with a hematologist is important. Several therapies may be needed to control heavy bleeding in women with bleeding disorders [2,9]. Treatment may depend on whether future fertility is desired or not [2]. Hormonal therapy can include oral contraceptive pills, transdermal patches, vaginal rings, etonogestrel implants, injectable medroxyprogesterone acetate and the levonorgestrel-containing intrauterine system [5]. The pills, patch and ring work by reducing menstrual blood loss, preventing hemorrhagic cyst formation, and suppressing ovulation [2]. The intrauterine system works by decreasing endometrial growth [5]. Nonhormonal therapies include antifibrinolytic therapy such as tranexamic acid, aminocaproic acid, desmopressin and factor VIII and VWF concentrates such as Humate-P [5]. For administration of many nonhormonal therapies, consultation with a hematologist is important for coordination of care.

If fertility is not desired, invasive procedures can be considered, including endometrial ablation or hysterectomy in the setting of failed hormonal or nonhormonal management and when anatomic pathologies have been ruled out as a potential cause. These procedures should not be considered in the adolescent population [2].

Survey method

In 2012, all 2224 APNs who were members of the National Association of Nurse Practitioners in Women's Health were sent, via email, a 25-question anonymous survey assessing training experiences and knowledge in the evaluation of heavy menstrual bleeding and bleeding disorders in women. Approval for this study was obtained from the Baylor College of Medicine Institutional Review Board. The survey asked about demographic information, training experience, current practice, and risk situations for heavy menstrual bleeding. Results were analyzed using chi square and simple t tests; a P value less than 0.05 determined statistical significance. Comparisons were made among responses from those reporting that their APN program addressed bleeding disorders versus programs which did not. In addition, responses were compared among those reporting they believed their training in bleeding disorders was sufficient to those who felt that their training was not sufficient.

Survey results

The after excluding 48 email addresses due to being returned as undeliverable, a response rate to the 2176 emailings that were received after two rounds was 17% (N = 370). Mean age of participants was 49.8 years. Graduation years from an APN program ranged from 1978 to 2012. Three-fourths (75.1%) of the participants were Women's Health Nurse Practitioners, and 90% of the participants were currently treating patients with heavy menstrual bleeding.

Seventy-six percent of participants reported their APN program addressed bleeding disorders (Table 1). A limitation of this study was that the information collected from the survey was based on recall. Some APNs could have received teaching but have since forgotten.

Table 1: Training received by study participants.

For the training you received in the evaluation of menorrhagia, did you receive teaching in any of the following formats?		
Answer options	**Yes**	**No**
A. Occasional didactic presentations on dysfunctional uterine bleeding?	89.91%	10.09%
B. Addressed bleeding disorders?	76.39%	23.60%
C. Systematically taught throughout training?	53.45%	47.16%
D. Clinical care/evaluation, supervised by preceptor?	74.30%	25.69%
E. Clinical care/evaluation, without preceptor supervision?	45.63%	54.69%
F. Taught in pediatric & adolescent gynecology	30.58%	70.44%
G. Taught in general gynecology	87.26%	12.73%

Table 2: Bleeding disorder clinical work-up.

Training sufficient in bleeding disorders	Yes 37.38% N = 140	No/No opinion 62.16% N = 230	P value
Routinely sent lab tests	124 (88.6%)	164 (71.3%)	0.0001
CBC	**24 (17.1%)**	**15 (6.5%)**	**0.001**
Factor VIII	34 (24.3%)	21 (9.1%)	< 0.0001
VW Panel	**111 (79.3%)**	**136 (59.1%)**	**< 0.0001**
TSH	36 (25.7%)	37 (16.1%)	0.02
Coags	**1 (0.7%)**	**1 (0.4%)**	**0.99**
VW multimer	1 (0.7%)	2 (0.9%)	0.99
Ristocetin cofactor	**0 (0%)**	**2 (0.9%)**	**0.53**
TEG	53 (37.9%)	63 (27.4%)	0.04
Iron panel	**14 (10%)**	**23 (10%)**	**0.99**
Fibrinogen	1 (0.7%)	4 (1.7%)	0.41
PFA 100	**0 (0%)**	**0 (0%)**	---
All	5 (3.6%)	12 (5.2%)	0.46
None			

Table 3: Training received by specific disorder.

Please check the following disorders which may have been included in a training session on evaluation of menorrhagia in your advanced practice nursing program. (Check all that apply)	
Answer options	**Response Percent**
Von Willebrand disease type 1	59.50%
Von Willebrand disease type 2	15.70%
Von Willebrand disease type 3	14.60%
Bernard-Soulier	0.80%
ITP (Idiopathic thrombocytopenic purpura)	50.00%
TTP (thrombotic thrombocytopenic purpura)	25.10%
Anemia chronic disease	56.80%
IDA (iron deficiency anemia)	64.90%
Blackfan-Diamond syndrome	0.80%
Hemophilia	45.40%
Glanzman's thrombasthenia	0.00%

In addition, 62.2% of participants felt like their training was not sufficient in the medical evaluation of bleeding disorders in preparation for clinical practice (Table 2). Nearly 16% reported that heavy menstrual bleeding at menarche would prompt a bleeding disorder workup. Over 43% of participants reported that heavy menstrual bleeding as an adult woman or postpartum hemorrhage would prompt them to consider a bleeding disorder workup. Over 65% reported they would order, as part of the clinical workup, no more than a complete blood count and thyroid-stimulating hormone for a patient with a history of heavy menstrual bleeding. When asked about education in school for VWD specifically, over half (59.5%) reported learning about Type 1 VWD and less than 16% reported learning about Types 2 and 3 (Table 3).

Discussion

From our survey that assessed training experiences and knowledge in the evaluation of heavy menstrual bleeding and bleeding disorders in women, we found that it was not more likely for respondents whose programs addressed bleeding disorders to ask more routine questions about bleeding history symptoms (nosebleeds, gum bleeding, easy bruising) in their current practice, but it was more likely for them to routinely order VWF and identify that thyroid abnormalities can make bleeding worse. This same group were no more likely to identify other risk situations that can make a bleeding condition better or worse (nonsteroidal anti-inflammatory drugs, renal disease, oral contraceptive pills, etc) or different scenarios (heavy menstrual bleeding at menarche, postpartum hemorrhage, heavy menstrual bleeding as adult women) that would prompt a workup compared to the group whose program did not address bleeding disorders.

We found that during clinical experience in school, APNs whose programs addressed bleeding disorders were more likely to ask a few more questions in regards to bleeding history such as number of pads and tampons changed in a 24-hour period. We were surprised to find that VWD was not the most commonly taught bleeding disorder. We recommend that APN programs place more emphasis on different bleeding disorders, including important history-taking questions and appropriate workups for risk situations. The academic community may find that structured training in the basics of bleeding disorders is helpful for future planning in APN curriculum.

Conclusion

Awareness of bleeding disorders, including VWD, is very important as these conditions are often underdiagnosed [2]. Personal and family history of bleeding symptoms are important and should raise suspicion to test for a bleeding disorder. Establishing an early diagnosis, in conjunction with a hematologist, is important in order to start effective treatment and increase the quality of life for affected patients [2].

References

1. National Heart Lung and Blood Institute, NHLBI von Willebrand Disease Expert Panel (2007) The diagnosis, evaluation, and management of von Willebrand disease. NIH publication: 08-5832.
2. James AH, Kouides PA, Abdul-Kadir R, Edlund M, Federici AB, et al. (2009) Von Willebrand disease and other bleeding disorders in women: consensus on diagnosis and management from an international expert panel. Am J Obstet Gynecol 201: e1-e8.
3. James AH, Manco-Johnson MJ, Yawn BP, Dietrich JE, Nichols WL (2009) Von Willebrand disease: key points from the 2008 National Heart, Lung, and Blood Institute guidelines. Obstet Gynecol 114: 674-676.
4. Philipp CS, Faiz A, Dowling N, Dilley A, Michaels LA, et al. (2005) Age and the prevalence of bleeding disorders in women with menorrhagia. Obstet Gynecol 105: 61-66.
5. Halimeh S (2012) Menorrhagia and bleeding disorders in adolescent females. Hamostaseologie 32: 45-50.
6. Sanders S, Purcell S, Silva M, Palerme S, James P (2012) Relationship between diagnosis and intervention in women with inherited bleeding disorders and menorrhagia. Haemophilia 18: e273-e276.
7. Rae C, Furlong W, Horsman J, Pulleynayegum E, Demers C, et al. (2013) Bleeding disorders, menorrhagia and iron deficiency: impacts on health-related quality of life. Haemophilia 19: 385-391.
8. Kleinert D, Orto C, Gioia K, Hannan M (1997) Von Willebrand disease: a nursing perspective. J Obstet Gynecol Neonatal Nurs 26: 271-276.
9. Weiss JA (2012) Just heavy menses or something more? Raising awareness of von Willebrand disease. Am J Nurs 112: 38-44.
10. Sadler JE, Budde U, Eikenboom JC, Favaloro EJ, Hill FG, et al. (2006) Update on the pathophysiology and classification of von Willebrand disease: a report of the Subcommittee on von Willebrand Factor. J Thromb Haemost 4: 2103-2114.
11. Rodeghiero F (2013) Von Willebrand disease: pathogenesis and management. Thromb Res 131: S47-S50.
12. Favalor EJ (2011) Von Willebrand disease: local diagnosis and management of a globally distributed bleeding disorder. Semin Thromb Hemost 37: 440-455.