GENERAL GYNECOLOGY

Submucosal fibroids and the relation to heavy menstrual bleeding and anemia

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OBJECTIVE: The objective of the study was to determine the contribution of submucosal fibroids (SMs) to heavy menstrual bleeding (HMB) and anemia among women with HMB.

STUDY DESIGN: Our retrospective study included premenopausal women who presented to a tertiary care center for HMB between January 2007 and October 2011. All women in this cohort underwent flexible office hysteroscopy (n = 1665) and 259 (15.6%) had SMs. We also reviewed the clinical ultrasounds (n = 914) from these women to determine whether SMs (n = 148) or any fibroids (n = 434) were present in the uterus. Clinical evaluation of bleeding included hemoglobin and pictorial blood loss assessment charts.

RESULTS: In our cohort, hysteroscopically diagnosed SMs were associated with significantly lower hemoglobin (adjusted difference −0.35 g/dL; 95% confidence interval [CI], −0.56 g/dL to −0.13g/dL) and higher risk of anemia (odds ratio [OR], 1.46; 95% CI, 1.04−2.03). Women with ultrasound-diagnosed SMs had lower hemoglobin and anemia, but results were not significant once adjusted for confounders (hemoglobin: adjusted difference −0.21 g/dL; 95% CI, −0.47g/dL to 0.06 g/dL; and anemia: OR, 1.28; 95% CI, 0.82−1.97). Ultrasound-diagnosed fibroids anywhere in the uterus were not associated with hemoglobin ($P = .7$) or anemia ($P = .8$). Self-reported pictorial blood loss assessment charts scores did not differ between women with and without fibroids diagnosed by either hysteroscopy or ultrasound ($P = .4$ and $P = .9$, respectively).

CONCLUSION: SMs were related to lower hemoglobin and higher risk of anemia but not self-reported bleeding scores. Diagnostic modality was important: hysteroscopically diagnosed SMs had lower hemoglobin and more anemia than ultrasound-diagnosed SMs. This may explain the inconsistent results in the literature.

Key words: anemia, office hysteroscopy, pictorial blood loss assessment score, submucosal fibroid, ultrasound

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Submucosal fibroids (SMs) are presumed to cause heavy menstrual bleeding (HMB) leading to anemia, but not all research supports this. The definition of SM can vary from distorting the uterine cavity to being adjacent to it, and the classification depends on the diagnostic modality used. Hysteroscopy and sonohysterography are able to distinguish distortion of the uterine cavity better than ultrasound alone. Thus, studies that use hysteroscopy may define SMs differently than those that use ultrasound.

Clinical studies indicate that the removal of SMs that distort the uterine cavity will decrease HMB. Bleeding was controlled by myomectomy in 81% of women in one study[1] and 94% in a second study.[2] Studies of long-term outcomes of hysteroscopic myomectomy demonstrate a 14-86% improvement rate in HMB inversely related to fibroid size.[3,4] However, other studies have not found an association between HMB and submucosal location. An ultrasound-based cross-sectional study concluded that size of the fibroid, but not submucosal classification, was related to gushing-type bleeding.[5] A sonohysterography-based study found that both intramural fibroids and SMs were fairly equally related to bleeding.[6]

The Mayo Clinic hysteroscopy database is a unique resource well suited to determining the association of HMB and anemia caused by SMs. We hypothesized that hysteroscopically diagnosed SMs would contribute to lower hemoglobin, higher risk of anemia, and higher pictorial blood loss assessment chart (PBLAC) scores among women with HMB. We also hypothesized that ultrasound-diagnosed fibroids would have less impact on bleeding than hysteroscopically diagnosed tumors and would depend on fibroid location.

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We have more than 3500 patients recorded who have undergone a hysteroscopic evaluation for abnormal uterine bleeding over the past 5 years. On these same women, we have systematically recorded the available clinical ultrasound data to compare with data from hysteroscopy.

Materials and Methods

We collected clinical data on women who were treated by our physician group between January 2007 and October 2011. All women had undergone a flexible office hysteroscopy for evaluation of HMB (Figure). The institutional review board approved the protocol and only women who provided research authorization were included in the study. Demographic, clinical, and laboratory variables were abstracted from the patient electronic medical records. During their clinical visit, participants were routinely asked about the use of iron supplements and hormones and their risks of endometrial hyperplasia including obesity, infertility, diabetes, and hypertension. A standardized evaluation form was implemented early in 2009 to document these results.

Office hysteroscopy was performed using flexible Olympus Hyf-XP (Tokyo, Japan) 3.1 mm scopes without local anesthesia (unless necessary or requested by patient) and using saline as the distending media. Saline was gravity fed with intracavitary pressures of 50 mm Hg or less. Hysteroscopic diagnoses were categorized on visualization of cavity using 18 predetermined diagnoses including submucosal fibroid. Inadequate hysteroscopies in which the visualization of the cavity did not occur were documented (n = 10) and were excluded from analyses.

The cohort was divided into women with any documented SMs by hysteroscopy and those without any SMs. The class of SM described by the surgeon was recorded using the European Society for Gynecologic Endoscopists' classification system, with class 0 being completely in the cavity, class 1 more than 50% in the cavity, and class 2 less than 50% in the cavity.[2]

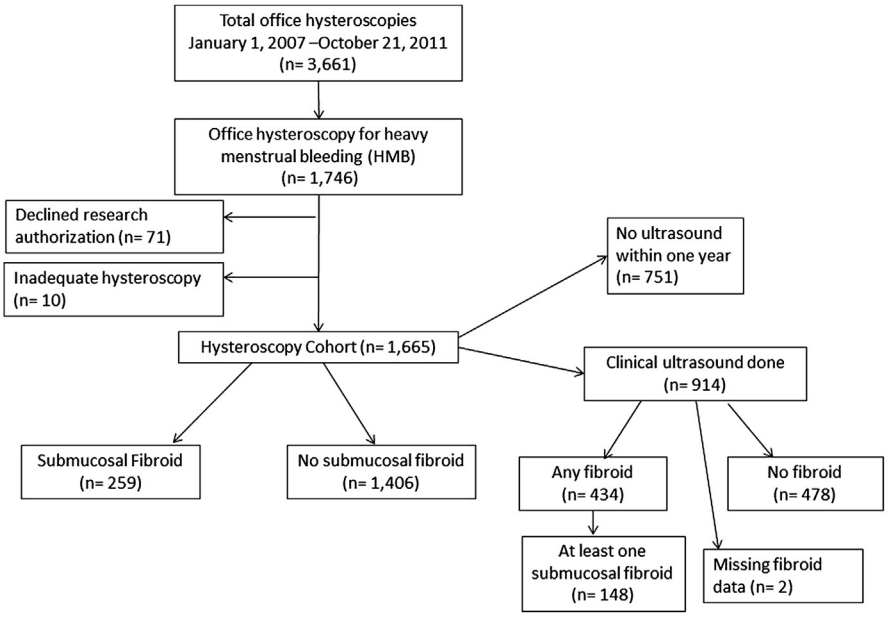
A PBLAC was used to document bleeding at the clinical visit. This is a validated measure of blood loss that asks women to quantify the number of tampons and pads used per day for each day in their cycle.[7] The number of clots and menstrual accidents is also quantified and the weighted scores added together. A score of more than 100 corresponds to 80 mL blood loss and represents HMB. Hemoglobin and iron store measures, including mean corpuscular volume and ferritin, were recorded when available from routine laboratory draws done within 1 year prior to or at the time of hysteroscopy. We performed a sensitivity analysis comparing PBLAC scores to anemia and hemoglobin to evaluate the relationship between the subjective and objective measures of bleeding.

Additionally, we collected data from patients in the hysteroscopy cohort who underwent ultrasound for clinical purposes within the past year. Standard protocol for ultrasound is to view and measure the fibroids in 2 views and document volume by cine clip. Type of fibroids (intramural, subserosal, and submucosal) was recorded from ultrasound reports. For missing data, images were reviewed and data recorded by 1 of 2 gynecologists (S.K.L., K.P.). Fibroids on ultrasound report that were listed as abutting, distorting, or in the uterine cavity were classified as submucosal fibroids for this study. Thirty-six fibroids were listed as unknown and were reviewed by one of the authors (S.K.L.). Three fibroids could not be classified and the other 33 were categorized based on image review.

The first comparison was made between women with ultrasound-diagnosed submucosal fibroids vs women with nonsubmucosal fibroids or no fibroids limited only to women with an ultrasound (to limit misclassification). Second, we compared women with any ultrasound-diagnosed fibroids (submucosal, intramural, and subserosal) with those without fibroids limited only to women who had an ultrasound done.

Lastly, because all women with an ultrasound also had a hysteroscopy, we created a concordance variable that included women who had SMs on both ultrasound and hysteroscopy. This concordance variable was then used to run a sensitivity analysis on the

FIGURE
Office hysteroscopy flow chart



Flow chart of the women with office hysteroscopy for heavy menstrual bleeding included in our analyses of submucosal fibroids is shown. Clinical data on ultrasounds are included with data on any fibroids and submucosal fibroids.

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