

Submucosal Uterine Fibroids are Associated with Bacterial Vaginosis

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BACKGROUND

- Fibroids affect up to 70% of women overall and over 80% of Black women, while bacterial vaginosis (BV) affects up to 30% of women overall and over 50% of Black women
- Fibroid symptoms include abnormal uterine bleeding, pelvic pressure and pain, and reproductive issues
- BV symptoms include vaginal discomfort and pain, increased risk of STIs, and reproductive issues
- Women with BV are stigmatized due to a perceived link between BV and risky sexual behavior
- The etiology of BV is unclear, but is thought to be characterized by an imbalanced vaginal microbiome
- Prior associations have been suggested between BV, fibroids, irregular vaginal bleeding, and high pH
- Submucosal fibroids (FIGO types 0-2), cause a higher likelihood of abnormal uterine bleeding, as opposed to intramural or subserosal fibroids that do not distort the endometrial cavity (FIGO types 2-8)
- No studies have investigated the association between the specific location of submucosal fibroids (FIGO types 0-2) with a subsequent diagnosis of BV

STUDY OBJECTIVE

- The objective of this study was to investigate the association between submucosal fibroids and bacterial vaginosis, with a focus on fibroid location

METHODS

Study Design

- Retrospective cohort study of patients with documented uterine fibroids with or without a subsequent diagnosis of BV

Setting

- Johns Hopkins Hospital, Baltimore, MD (IRB00313428)

Population

- Data set provided with 9,905 subject records with fibroids and BV diagnoses, 1,572 subject records with fibroid diagnoses only
- Screened first 310 patients for inclusion
- 121 excluded for missing data, BV before fibroid diagnosis, ineligible age; **189 patients** included in final cohort

Data Collection

- Chart review of patient records in EPIC for demographics, medical history, fibroid size and location, symptoms, surgical history, medications

Main Outcomes

- Association between fibroid location and a subsequent diagnosis of BV
- Relationships between fibroid location and demographic characteristics, medical history, fibroid-related variables

Statistical Analysis

- Pearson's chi-squared test
- Fisher's exact test
- Wilcoxon Rank-Sum test
- Multivariate logistic regression models
- Performed using SAS 9.4

RESULTS

Figure 1. Demographic Characteristics of Study Cohort

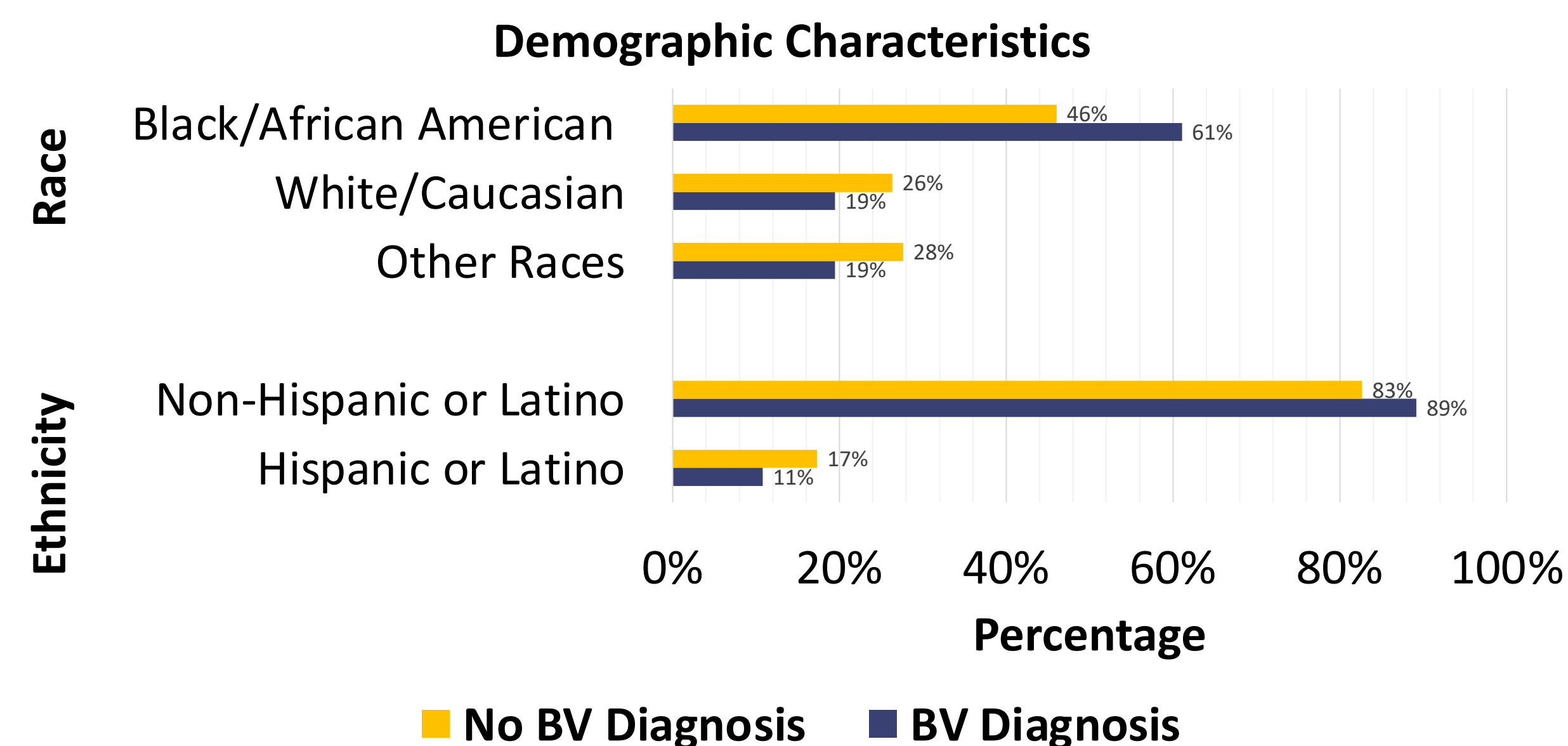


Table 1. Baseline Characteristics and Risk of Incident Bacterial Vaginosis Among Women with Fibroids

	Bacterial Vaginosis			P
	Yes	No	Total	
N (%)	113 (59.79)	76 (40.21)	189	
Number of fibroids				
1	45 (39.82)	44 (57.89)	89 (47.09)	0.0147
More than 1	68 (60.18)	32 (42.11)	100 (52.91)	
Fibroid location(s)				
Any submucosal				
No	81 (71.68)	68 (89.47)	149 (78.84)	0.0033
Yes	32 (28.32)	8 (10.53)	40 (21.16)	
Fibroid-related symptoms				
Menorrhagia				
No	39 (34.51)	56 (73.68)	95 (50.26)	<0.0001
Yes	74 (65.49)	20 (26.32)	94 (49.74)	
Anemia				
No	54 (47.79)	53 (69.74)	107 (56.61)	0.0028
Yes	59 (52.21)	23 (30.26)	82 (43.39)	
Number of fibroid surgery types				
None	43 (38.05)	61 (80.26)	104 (55.03)	<0.0001
1	62 (54.87)	13 (17.11)	75 (39.68)	
2	7 (6.19)	2 (2.63)	9 (4.76)	
3	1 (0.88)	0 (0)	1 (0.53)	
Number of medication types for uterine bleeding				
None	63 (55.75)	65 (85.53)	128 (67.72)	0.0003
1	30 (26.55)	6 (7.89)	36 (19.05)	
2	14 (12.39)	5 (6.58)	19 (10.05)	
3	4 (3.54)	0 (0)	4 (2.12)	
4	1 (0.88)	0 (0)	1 (0.53)	
5	1 (0.88)	0 (0)	1 (0.53)	

Table 2. Multivariate Analysis of the Relationships Between Submucosal Fibroids and a Subsequent BV Diagnosis

Parameter	Estimate	SE	P	Odds Ratio (95% CI)
Intercept	0.5755	0.9737	0.5545	
Race (Black vs White)	0.282	0.254	0.267	1.488 (0.692–3.199)
Number of fibroids	0.302	0.158	0.056	1.829 (0.985–3.396)
Any submucosal	0.556	0.218	0.011	3.040 (1.294–7.142)

CONCLUSIONS

Submucosal fibroids were strongly associated with BV

- Submucosal fibroids and BV were both associated with heavy bleeding and anemia requiring surgery or medication
- Iron may facilitate the growth of bacteria associated with BV

Endometrial bleeding leading to increased vaginal iron is a possible explanation for the association between submucosal fibroids and BV

- No association between race or ethnicity and BV in this sample

LIMITATIONS

- Potential data collection and accuracy errors due to the retrospective nature of the study
- Possible variation in fibroid location classification and size measurements based on the method of data collection
- Data limited to the electronic medical record at one institution, possibly missing diagnoses made at other institutions
- Some potential confounding variables were unaccounted for, due to the difficulty of standardizing the data relative to the date of fibroid or BV diagnosis
- Limited proportion of Asian and Hispanic or Latino participants

IMPLICATIONS

- Additional research needed to confirm a causal relationship between submucosal fibroid-related bleeding and BV
- If substantiated, this research could change the belief that BV is caused by unsafe sexual practices and alleviate stigma
- Could transform treatment algorithms and clinical practice by leading to screening for submucosal fibroids and bleeding in patients with recurrent BV
- Future prospective studies should include assessment of the vaginal microbiome in women with submucosal fibroids
- Future interventional studies could evaluate the likelihood of BV recurrence in women with submucosal fibroids treated with the standard of care versus medication or surgery for their bleeding

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