

# Associations of Postoperative Outcomes in Laparoscopic versus Vaginal Hysterectomies

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## Introduction

- 1 in 9 women will have a hysterectomy in their lifetime
- ACOG recommends vaginal hysterectomy over laparoscopic hysterectomy when feasible

## Objective

To compare the occurrence of postoperative complications and mortality between vaginal and laparoscopic hysterectomies while controlling for potential confounders

## Methods

**Design:** Historical Analytical Cohort Study

**Data Source:** ACS NSQIP datasets from 2018-2021

**Study Population:**

Women 18-65 years old who underwent vaginal or laparoscopic hysterectomy for benign indications.

**Exposure:** Hysterectomy, vaginal versus laparoscopic

**Outcome:** Mortality or other postoperative complications, such as # of UTIs, deep incisional SSIs, etc.

**Control Variables:** Demographics, Comorbidities, BMI

**Analysis:**

- Bivariate: control variables vs. exposures ( $\chi^2$  test)
- Multivariable: Adjusted odds ratios and 95% confidence intervals, fitting an unconditional multivariable binary logistic regression model

## Results

**Baseline Demographics:**

- Statistically significant differences in all baseline characteristics between vaginal and laparoscopic hysterectomy groups
- Women who underwent vaginal hysterectomy were:
  - Older than 44 years old
  - Lower frequency of African Americans
  - Higher frequency of Hispanic ethnicity
  - More frequently normal, or overweight BMI,
  - Higher prevalence of current smokers
  - Lower prevalence of diabetes mellitus

## Results

Table 3 - Unadjusted and Adjusted Associations of Type of Hysterectomy and Control Variables with Deaths and Complications among US Adult Women (Aged 18-65) undergoing Hysterectomy

Characteristics	Unadjusted		Adjusted	
	OR (95% CI)	p-value	OR (95% CI)	p-value
<b>Type of Hysterectomy</b>				
Laparoscopic (REF)	-	-	-	-
Vaginal	1.60 [1.50-1.70]	< 0.01	1.66 [1.56-1.76]	< 0.01
<b>Age</b>				
44 and younger (REF)	-	-	-	-
45 to 51	0.93 [0.88-0.98]	0.014	0.96 [0.91-1.02]	0.198
52 to 64	0.80 [0.75-0.85]	< 0.01	0.80 [0.75-0.85]	< 0.01
<b>BMI</b>				
Underweight	1.17 [0.84-1.61]	0.351	1.13 [0.81-1.56]	0.472
Normal (REF)	-	-	-	-
Overweight	1.01 [0.94-1.10]	0.718	0.99 [0.92-1.07]	0.834
Obesity Class I	1.12 [1.04-1.21]	< 0.01	1.10 [1.01-1.19]	0.021
Obesity Class II	1.16 [1.07-1.26]	< 0.01	1.16 [1.06-1.26]	< 0.01
Obesity Class III	1.23 [1.13-1.33]	< 0.01	1.25 [1.15-1.36]	< 0.01
<b>Race</b>				
Asian	0.71 [0.61-0.83]	< 0.01	0.77 [0.66-0.91]	< 0.01
Black or African American	1.81 [1.01-1.16]	0.025	1.07 [0.99-1.15]	0.069
Unknown or Not Reported	1.14 [1.07-1.22]	< 0.01	1.07 [0.97-1.17]	0.180
White (REF)	-	-	-	-
Other Race	1.11 [0.94-1.31]	< 0.01	1.08 [0.92-1.27]	0.364
<b>Ethnicity</b>				
Non-Hispanic (REF)	-	-	-	-
Unknown	1.16 [1.09-1.25]	< 0.01	1.09 [0.98-1.21]	0.105
Hispanic	1.12 [1.05-1.20]	< 0.01	1.09 [1.01-1.218]	0.023
<b>Current Smoker</b>				
Yes	1.28 [1.20-1.36]	< 0.01	1.24 [1.16-1.32]	< 0.01
<b>Diabetes</b>				
Yes	1.16 [1.08-1.26]	< 0.01	1.15 [1.06-1.24]	< 0.01

Table 2 - Occurrence of Complication or Death among US Adult Women (Age 18-65) undergoing Hysterectomy \*

Type of Hysterectomy	Occurrence of Complication or Death		
	N	%	p-value
Laparoscopic	5,654	4.1	< 0.01
Vaginal	1,318	6.4	

\*adjusted for age, BMI, race, ethnicity, smoking, and diabetic status

Table 4 - Frequency of Death and Major Complications among US Adult Women (Aged 18-65) undergoing Hysterectomy

Condition	Death or Complications	
	N	%
Death	33	0.02
Urinary Tract Infection	4,026	2.55
Organ/Space SSI*	2,321	1.47
Sepsis	595	0.38
Wound Disturbance Occurrences	303	0.20
DVT/Thrombophlebitis	201	0.13
Pneumonia Occurrences	158	0.10
Deep Incisional SSI*	153	0.10
Unplanned Intubation Occurrences	60	0.04
Septic shock occurrences	60	0.04
On Ventilator > 48 hours	45	0.03
Cardiac Arrest Requiring CPR	38	0.02
Myocardial infarction	37	0.02
Acute Renal Failure Occurrences	30	0.02
Stroke/CVA	25	0.02

\*SSI = Surgical Site Infection

## Discussion

- Prior to adjustment, the odds for death or complications were 60% higher in the vaginal hysterectomy patients
- After adjustment, the odds ratio increased and was statistically significant
- Other factors associated with increased odds of complication or death were:
  - Age 44 or younger
  - Obesity
  - Hispanic ethnicity
  - Smoking
  - Diabetic status
- Findings contradict current ACOG recommendations
- Limitations:
  - Secondary data analysis
  - Limited variable reporting in database
  - Observational study, predisposing to selection bias

## Conclusions

**Implications for Practice:**

- Laparoscopic hysterectomies are associated with less postoperative complications and mortality than vaginal hysterectomies

**Implications for Future Research:**

- Future studies investigating the postoperative outcomes amongst minimally invasive hysterectomies
- Include considerations for robotic surgeries in future studies