The Impact of Preoperative HbA1c on Reoperation Rates in Women Undergoing Surgery for Stress Urinary Incontinence and Pelvic Organ Prolapse

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Introduction

- Prevalence of diabetes is rising
- Surgical procedures on patients with diabetes is also rising
- Ideal HbA1c cutoff for surgery is unknown
  - U.S. Endocrinologists have recommended delaying if > 8.0%
  - Limited evidence in urogynecologic surgery

Aim

To determine how HbA1c impacts risk of all-cause reoperation (for either recurrence or complications) in women undergoing an initial surgery for stress urinary incontinence or pelvic organ prolapse.

Methodology

Cerner Health Facts (HF) nationwide database

- 1/1/2010 to 11/30/2018
- 750 hospitals
- 519 million patient encounters

- ICD 9, ICD 10, and CPT codes for SUI and POP

- Included diabetic and non-diabetic patients who had HbA1c between 3 months before and 6 months after initial surgery

- 2 separate analyses comparing those who underwent reoperation vs no-reoperation
  - All women undergoing surgery for SUI
  - All women undergoing surgery for POP

- Multivariable logistic regression to determine impact of HbA1c on reoperation both as a continuous variable and comparing cut-off values of ≥8 vs. <8

Results

- **HbA1c level**, whether as dichotomous or continuous variable, **did not significantly predict reoperation**
  - Results similar for both POP and SUI populations
- In SUI surgeries, younger age, hospital in the Northeast region, urinary retention predicted reoperation
  - Vaginal atrophy was protective against reoperation
- In POP surgeries, younger age, hospitals in the Northeast, South, or West regions, and rural hospitals predicted reoperation

Figure 1

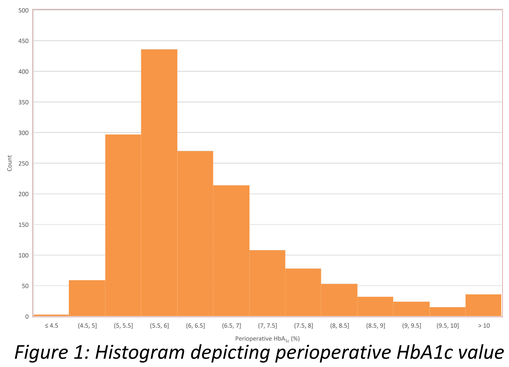

Figure 1: Histogram depicting perioperative HbA1c value closest to index surgery in the SUI population (N=1625)

Figure 2

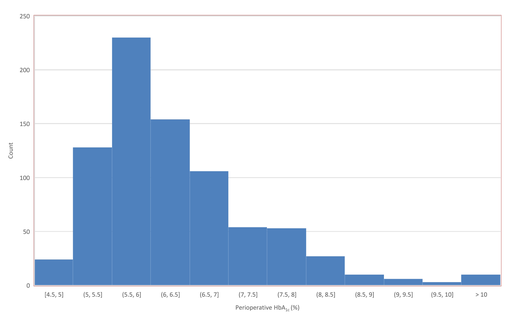

Figure 2: Histogram depicting perioperative HbA1c value closest to index surgery in the POP population (N=805)

Multivariate Logistic Regression for Undergoing Reoperation after Stress Urinary Incontinence Surgery HbA1c Expressed as a Dichotomous Variable ≥8

Effect	Unadj. OR	95% CI	Adj. OR	95% CI
HbA1c ≥ 8 (vs < 8)	0.92	0.50 – 1.71	0.77	0.39 – 1.39
Age	0.98	0.97 - 0.99	0.98	0.96 – 1.00
Race (White is reference)				
Black	2.00	1.12 – 3.59	1.53	0.79 – 2.80
Other*	1.14	0.66 – 1.95	1.12	0.62 – 1.92
Urban Hospital	0.64	0.43 - 0.96	0.688	0.45 – 1.05
US Region**				
Northeast	1.93	1.22 – 3.07	2.02	1.24 – 3.29
South	0.99	0.57 – 1.74	1.10	0.62 – 1.96
West	0.73	0.41 – 1.29	0.71	0.40 – 1.29
Vaginal Atrophy	0.31	0.10 – .76	0.35	0.10 – 0.87
Allergies	1.76	0.83 – 3.35	1.99	0.92 – 3.94
Concomitant POP surgery	0.60	0.39 – .91	0.77	0.49 – 1.21
Urinary Retention	2.68	1.01 – 7.16	3.77	1.18 –10.1

Multivariate Logistic Regression for Undergoing Reoperation after Pelvic Organ Prolapse Surgery HbA1c Expressed as a Dichotomous Variable ≥8

Variable	Unadj. OR	95% CI	Adj. OR	95% CI
HbA1c ≥ 8 (vs < 8)	1.17	0.34 – 3.02	0.99	0.28 – 2.66
Age	0.97	0.95 - 0.99	0.97	0.95 – 1.00
Urban Hospital	0.24	0.13 - 0.4	0.192	0.09 – 0.39
US Region**				
Northeast	3.07	1.00 –9.75	3.16	1.00 – 10.23
South	2.52	0.86 – 7.79	5.93	1.82 – 20.61
West	4.85	2.06 – 13.31	5.52	2.30 – 15.42

**=Any race other than Black or White*
***=Midwest reference*

Baseline Demographics & Potential Confounders

Stress Urinary Incontinence Cohort				
	Reoperation			
Variable	No (N=1505)	Yes (N=120)	Total (N=1625)	p-value
Age*	61.0 (50.0 – 69.0)	55.0 (47.0 – 68.0)	60.0 (50.0 – 69.0)	< .01
HbA1c *	6.1 g/dL (5.6 – 6.9)	6.0 g/dL (5.6 – 6.8)	6.1 g/dL (5.6 – 6.9)	0.35
HbA1c ≥ 8 g/dL	162 (10.76%)	12 (10.00%)	174 (10.71%)	0.79
Race				0.06
White	1199 (79.67%)	88 (73.33%)	1287 (79.20%)	
Black	102 (6.78%)	15 (12.50%)	117 (7.20%)	
Other***	204 (13.55%)	17 (14.17%)	221 (13.60%)	
US Region				< .01
Midwest	499 (33.16%)	35 (29.17%)	534 (32.86%)	
Northeast	332 (22.06%)	45 (37.50%)	377 (23.20%)	
South	301 (20.00%)	21 (17.50%)	322 (19.82%)	
West	373 (24.78%)	19 (15.83%)	392 (24.12%)	
Rural	353 (23.46%)	39 (32.50%)	392 (24.12%)	0.03
Obesity	255 (16.94%)	25 (20.83%)	280 (17.23%)	0.28
Tobacco Use	290 (19.27%)	28 (23.33%)	318 (19.57%)	0.28
Vaginal Atrophy	149 (9.90%)	4 (3.33%)	153 (9.42%)	0.02
Urinary Frequency	60 (3.99%)	11 (9.17%)	71 (4.37%)	< .01
Dysuria	79 (5.25%)	9 (7.50%)	88 (5.42%)	0.29
POP Concomitant	569 (37.81%)	32 (26.67%)	601 (36.98%)	0.02
UTI	193 (12.82%)	20 (16.67%)	213 (13.11%)	0.23
Urinary Retention	24 (1.59%)	5 (4.17%)	29 (1.78%)	0.06

Pelvic Organ Prolapse Cohort				
	Reoperation			
Variable	No (N= 761)	Yes (N=44)	Total (N= 805)	p-value
Age*	67.0 (58.0-74.0)	60.5 (54.0-70.0)	67.0 (58.0-74.0)	< .01
HbA1c *	6.1 g/dL (5.7-6.8)	6.2 g/dL (5.6-6.6)	6.1 g/dL (5.7-6.8)	0.60
HbA1c ≥8 g/dL	60 (7.88%)	4 (9.09%)	64 (7.95%)	0.77
Race				0.41
White	558 (73.32%)	31 (70.45%)	589 (73.17%)	
Black	75 (9.86%)	7 (15.91%)	82 (10.19%)	
Other***	128 (16.82%)	6 (13.64%)	134 (16.65%)	
US Region				< .01
Midwest	282 (37.06%)	6 (13.64%)	288 (35.78%)	
Northeast	107 (14.06%)	7 (15.91%)	114 (14.16%)	
South	149 (19.58%)	8 (18.18%)	157 (19.50%)	
West	223 (29.30%)	23 (52.27%)	246 (30.56%)	
Rural	196 (25.76%)	26 (59.09%)	222 (27.58%)	< .01
Obese	94 (12.35%)	5 (11.36%)	99 (12.30%)	0.85
Smoker	119 (15.64%)	4 (9.09%)	123 (15.28%)	0.24
Vaginal Atrophy	110 (14.45%)	3 (6.82%)	113 (14.04%)	0.16
Urinary Freq	28 (3.68%)	1 (2.27%)	29 (3.60%)	1.00
Dysuria	40 (5.26%)	0 (0.00%)	40 (4.97%)	0.16
SUI Concomitant	343 (45.07%)	16 (36.36%)	359 (44.60%)	0.26
UTI	60 (7.88%)	1 (2.27%)	61 (7.58%)	0.24
Urinary Retention	11 (1.45%)	0 (0.00%)	11 (1.37%)	1.00

Conclusion

Principal Findings:

- No significant impact of HbA1c on total rates of reoperation in both SUI and POP surgical cohorts
- Given the results of other studies, it is reasonable to delay elective urogynecologic surgery to avoid postoperative complications, although the risk on reoperation is less clear

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