Racial Disparities in Thyroidectomy and Parathyroidectomy Surgery—A NSQIP Analysis

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Abstract

Objectives: To assess the impact of race and ethnicity on 30-day complications following thyroidectomy and parathyroidectomy surgery.

Methods: The National Surgical Quality Improvement Program database was queried for all cases of thyroidectomy and parathyroidectomy procedures from 2005-2019. Demographic, comorbidity, and postoperative complication data were compared according to race/ethnicity using univariate and binary logistic regression analyses.

Results: A total of 248,778 patients were included, consisting of 77.6% White, 12.1% Black, 3.8% Asian, 5.1% Hispanic, 0.3% American Indian/Alaska Native, and 1.2% other. Black and Asian patients had overall increased odds of medical (Black: OR=1.308, 95% CI: 1.181-1.449, p<.001; Asian: OR=1.285, 95% CI: 1.042-1.585, p=0.019) and all (Black: OR=1.150, 95% CI: 1.052-1.258, p=.002; Asian: OR=1.210, 95% CI: 1.015-1.442, p=0.033) complications in comparison to White patients. Black and Asian patients had a higher likelihood for reintubation (Black: OR=1.907, 95% CI: 1.609-2.260, p<.0001; Asian: OR=1.493, 95% CI: 1.027-2.170, p=.036), extended ventilator usage (Black: OR=2.181, 95% CI: 1.730-2.751, p<.001; Asian: OR=2.016, 95% CI: 1.215-3.343, p=.007), cardiac arrest (Black: OR=2.208, 95% CI: 1.520-3.206, p<.001; Asian: OR=2.458, 95% CI: 1.159-5.214, p=0.019), and bleeding (Black: OR=2.062, 95% CI: 1.605-2.650, p<.001; Asian: OR=2.155, 95% CI: 1.322-3.511, p=.002). Furthermore, Black patients were more likely to experience postoperative renal insufficiency (OR=1.721, 95% CI: 1.011-2.930, p=.046) and deep vein thromboses (OR=1.490, 95% CI: 1.015-2.188, p=.042). Compared to White patients, Hispanic patients were over twice as likely to experience postoperative bleeding (OR=2.240, 95% CI: 1.512-3.318, p<.001), and Native American patients were 4 times as likely to have a myocardial infarction (OR=4.661, CI: 1.117-19.451, p=.035).

Conclusion: Black, Asian, Native American, and Hispanic patients were more likely to have 30-day complications following thyroidectomy and parathyroidectomy compared to White patients. Further studies should be devoted to understanding the roots of these inequities to improve outcomes.

Introduction

- Parathyroidectomy and thyroidectomy are common surgical procedures in the United States.[1] The impact of race on outcomes has not been explored to date.
- The purpose of this study was to analyze the impact of race on postoperative complications following thyroidectomy and parathyroidectomy surgery.

Methods and Materials

- The NSQIP database was queried for cases ranging from 2005 to 2019.
- Patients with a Current Procedural Terminology (CPT) code for thyroidectomy and parathyroidectomy procedure (60500, 60502, 60505, 60512, 60210, 60212, 60220, 60225, 60240, 60252, 60254, 60260, 60270, 60271) were selected.
- Patients were stratified into White, Black, Asian, Hispanic, American Indian/Alaska Native, and Other racial cohorts.
- SPSS 24 (IBM, Armonk, New York) was used for cross tabulation, univariate Pearson's chi-square analysis and multivariate logistic regression.

Table 1 – Patient Demographics

	White	Black	Asian	Hispanic	American Indian	Other	P value
Total, n (%)	193012 (77.6)	30008 (12.1)	9421 (3.8)	12631 (5.1)	709 (0.3)	2997 (1.2)	
Age groups							**<.001**
16-39 years	35796 (18.5)	5606 (18.7)	2473 (26.2)	3389 (26.8)	218 (30.7)	623 (20.8)	
40-59 years	80566 (41.7)	14728 (47.6)	4273 (45.4)	5816 (46.0)	295 (41.6)	1418 (47.3)	
60-79 years	69954 (36.2)	9506 (31.7)	2494 (26.5)	3205 (25.4)	185 (26.1)	863 (28.8)	
80+ years	6696 (3.5)	618 (2.1)	181 (1.9)	221 (1.7)	11 (1.6)	93 (3.1)	
Gender (%)							**<.001**
Female	149139 (77.3)	24466 (81.5)	7481 (79.4)	10473 (82.9)	576 (81.5)	2327 (77.9)	
Male	43738 (22.7)	5536 (18.5)	1936 (20.6)	2157 (717.1)	131 (18.5)	662 (22.1)	
Comorbidities (%)							
Diabetes	23689 (12.3)	6265 (20.9)	1255 (13.3)	2108 (16.7)	109 (15.4)	327 (10.9)	**<.001**
Smoking	26056 (13.5)	5190 (17.3)	574 (6.1)	1143 (9.0)	192 (27.1)	388 (12.9)	**<.001**
Steroid Use	5030 (2.6)	1113 (3.7)	173 (1.8)	326 (2.6)	27 (3.8)	43 (1.4)	**<.001**
Recent Weight Loss	1092 (0.6)	249 (0.8)	35 (0.4)	70 (0.6)	5 (0.7)	18 (0.6)	**<.001**
ASA Cohorts							**<.001**
1	12169 (6.3)	769 (2.6)	1060 (11.3)	742 (5.9)	16 (2.3)	286 (9.5)	
2	117039 (60.7)	14381 (48.0)	6381 (67.9)	7766 (61.5)	367 (51.8)	2052 (68.5)	
3	60194 (31.2)	13297 (44.4)	1881 (20.0)	3870 (30.6)	306 (43.2)	642 (21.54)	
4	3258 (1.7)	1532 (5.1)	81 (0.9)	249 (2.0)	19 (2.7)	16 (0.5)	
Complications							
Bleeding	222 (0.1)	118 (0.4)	20 (0.2)	30 (0.2)	1 (0.1)	1 (0.0)	**<.001**
Medical	2071 (1.1)	602 (2.0)	100 (1.1)	136 (1.1)	13 (1.8)	22 (0.7)	**<.001**
Surgical	1131 (0.6)	218 (0.7)	56 (0.6)	90 (0.7)	8 (1.1)	7 (0.2)	**.001**
All	3031 (1.6)	759 (2.5)	145 (1.5)	211 (1.7)	19 (2.7)	29 (1.0)	**<.001**

Table 2 – Multivariate Analysis of Impact of Race and Ethnicity on Postoperative Complications

Complication	Odds Ratio (OR)	95% CI for OR (lower, upper)	P-value*
Superficial Surgical Site Infection			
White	Reference		
Black	.478	(.362, .632)	**<.001**
Renal Insufficiency			
White	Reference		
Black	1.721	(1.011, 2.930)	**.046**
Deep Vein Thromboses			
White	Reference		
Black	1.490	(1.015, 2.188)	**.042**
Reintubation			
White	Reference		
Black	1.907	(1.609, 2.260)	**<.001**
Asian	1.493	(1.027, 2.170)	**.043**
Bleeding			
White	Reference		
Black	2.062	(1.605, 2.650)	**<.001**
Asian	2.155	(1.322, 3.511)	**.002**
Hispanic	2.240	(1.512, 3.318)	**<.001**
Cardiac Arrest			
White	Reference		
Black	2.208	(1.520, 3.206)	**<.001**
Asian	2.458	(1.159, 5.214)	**.019**
Myocardial Infarction			
White	Reference		
American Indian/Alaska Native	4.661	(1.117, 19.451)	**.035**
Medical Complications			
White	Reference		
Black	1.308	(1.181, 1.449)	**<.001**
Asian	1.285	(1.042, 1.585)	**.019**
All Complications			
White	Reference		
Black	1.150	(1.052, 1.258)	**.002**
Asian	1.210	(1.015, 1.442)	**.033**

Results

- 248,778 cases of parathyroidectomy and thyroidectomy surgeries were identified.
- **Table 1** shows patient demographics and univariate analysis between patient racial cohorts.
  - p-values listed were generated from univariate Pearson's chi square analysis.
- **Table 2** shows odds ratios (OR) generated from multivariate logistic regression for the impact of race on postoperative complications.

Conclusions

- Significant differences in comorbidities were seen across racial cohorts.
- Black race is associated with increased risk of postoperative renal insufficiency and deep vein thromboses.
- Black and Asian races are associated with increased risk of reintubation, bleeding, cardiac arrest, medical complications, and all complications after parathyroidectomy and thyroidectomy.
- Hispanic ethnicity is associated with bleeding complications following these procedures.
- Further research is needed to understand and address racialand ethnic disparities in parathyroid and thyroid surgery.

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