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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, Cl: 1.117-19.451, p=.035).

					American		
	White	Black	Asian	Hispanic	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 1 – Patient Demographics

Results

- 248,778 cases of parathyroidectomy and thyroidectomy surgeries were identified.
- Table 1 shows patient
 demographics and univariate analysis between patient racial cohorts.

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.

- 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.

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			

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

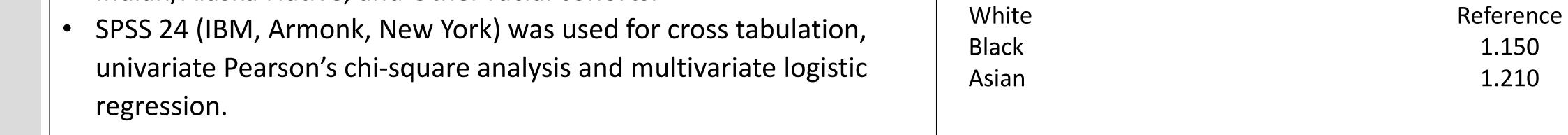
- The NSQIP database was queried for cases ranging from 2005 to 2019.
- Patients with a Current Procedural Terminology (CPT) code for thyroidectomy and parathyroidectomy procedure (60500, 60502, 60505, 60512, 60210, 60212, 60220, 60225, 60240, 60252, 60254, 60260, 60270, 60271) were selected.
- Patients were stratified into White, Black, Asian, Hispanic, American Indian/Alaska Native, and Other racial cohorts.

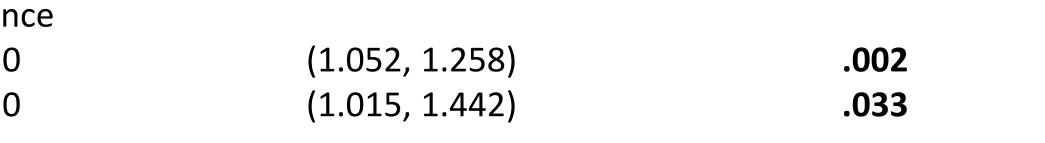
Renal Insufficiency
White
Black
Deep Vein Thromboses
White
Black
Reintubation
White
Black
Asian
Bleeding
White
Black
Asian
Hispanic
Cardiac Arrest
White
Black
Asian
Myocardial Infarction
White
American Indian/Alaska Native
Medical Complications
White
Black
Asian
All Complications

Reference		
1.721	(1.011, 2.930)	.046
Reference		
1.490	(1.015, 2.188)	.042
Reference		
1.907	(1.609, 2.260)	<.001
1.493	(1.027, 2.170)	.043
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Reference		
2.062	(1.605, 2.650)	<.001
2.155	(1.322, 3.511)	.002
2.240	(1.512, 3.318)	<.001
2.270	(1.312, 3.310)	
Reference		
2.208	(1.520, 3.206)	<.001
2.458	(1.159, 5.214)	.019
2.430	(1.139, 3.214)	.019
Reference		
4.661	(1.117, 19.451)	.035
4.001	(1.11/, 19.491)	.035
Reference		
1.308	(1.181, 1.449)	<.001
1.285		<.001 .019
1.203	(1.042, 1.585)	.019

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







Contact

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References

1. Henry, L. R., Helou, L. B., Solomon, N. P., Chang, A., Libutti, S. K., & Stojadinovic, A. (2012). Current practice patterns regarding the conduct of thyroidectomy and parathyroidectomy amongst surgeons-A survey study. *Journal of Cancer, 3,* 207.

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