Racial Disparities in Post-Operative Outcomes Following Inguinal Hernia Repair

Murphy Mostellar MD, Robert Tamer, Li-Ching Huang PhD, and Arielle Perez MD
Division of General and Acute Care Surgery, University of North Carolina, Chapel Hill, NC

Background

- Racial disparities within health care have been clearly established, including within the field of surgery



- Studies have shown racial disparities exist in the context of hernia surgery, one of the most common surgeries performed by general surgeons
  - Access to surgical care[1]
  - Access to surgical evaluation[2]
  - Access to MIS[3]
  - Elective vs Emergent repair[4-7]
- Limited studies evaluating racial disparities in post-operative outcomes in hernia surgery exist
- Purpose: Evaluate if there is a difference in post-operative outcomes and quality of life (QOL) in patients after inguinal hernia repair (IHR) based on patient race

Methods

- Adult patients (19,699) who had elective clean unilateral IHR with 30-day follow-up from the Abdominal Core Health Quality Collaborative (*ACHQC)* database
- Retrospective analysis of 30-day post-operative outcomes based on race (White, Black, Hispanic, Other)

Results

Table 1. Pt Characteristics

Variable	Combined N=19699	White N=16929	Black N=1334	Hispanic N=832	Other N=604	P-Value
Age	50 62 71	51 63 72	46 59 68	41 53 63	45 60 70	**<0.001**[1]
Gender						0.93[2]
Male	91% (17865)	91% (15351)	91% (1210)	90% (752)	91% (552)	
Female	9% (1834)	9% (1578)	9% (124)	10% (80)	9% (52)	
Distress Score: 0 (most prosperous) to 100 (most distressed)	12 28 55	11 24 49	42 73 91	25 50 74	10 21 46	**<0.001**[1]
Primary Insurance						**<0.001**[2]
Private	47% (9216)	47% (7996)	44% (589)	41% (338)	49% (293)	
Medicare	36% (7086)	38% (6410)	28% (379)	16% (137)	26% (160)	
Unknown	17% (3397)	15% (2523)	27% (366)	43% (357)	25% (151)	
BMI	24 26 29	24 26 28	23 26 30	25 27 30	23 25 28	**<0.001**[1]
ASA Class						**<0.001**[2]
1	17% (3352)	16% (2787)	14% (185)	26% (213)	28% (167)	
2	56% (11097)	57% (9631)	49% (654)	60% (497)	52% (315)	
3	25% (4844)	25% (4159)	34% (455)	14% (114)	19% (116)	
4	3% (315)	2% (269)	3% (34)	1% (8)	1% (4)	
5	0% (1)	0% (1)	0% (0)	0% (0)	0% (0)	
N/A	0% (68)	0% (60)	0% (6)	0% (0)	0% (2)	
Liver Failure	1% (119)	1% (104)	1% (7)	1% (6)	0% (2)	0.78[2]
Hypertension	37% (7201)	36% (6135)	49% (657)	26% (220)	31% (189)	**<0.001**[2]
Diabetes	7% (1469)	7% (1112)	14% (185)	10% (85)	14% (87)	**<0.001**[2]
Dialysis	0% (77)	0% (42)	2% (26)	1% (5)	1% (4)	**<0.001**[2]
COPD	3% (621)	3% (534)	5% (66)	1% (11)	2% (10)	**<0.001**[2]
Immunosuppression	2% (331)	2% (287)	2% (25)	1% (9)	2% (13)	0.12[2]
Current Smoker	10% (2036)	10% (1647)	20% (264)	10% (83)	7% (42)	**<0.001**[2]
Heart Failure	2% (304)	2% (259)	3% (37)	0% (4)	1% (4)	**<0.001**[2]

Table 1: Demographic and Pre-operative Evaluation. a b c represent the lower quartile a, the median b, and the upper quartile c for continuous variables. N is the number of non-missing values. Numbers after proportions are frequencies. Tests used: 1Kruskal-Wallis test; 2Pearson test.

- Many racial differences in patient characteristics
  - Distress Score
  - BMI
  - ASA Class
  - Comorbidities
    - HTN, Diabetes, CKD, COPD, Heart failure, Smoker

Table 2. Operative Details

Variable	Combined N=19699	White N=16929	Black N=1334	Hispanic N=832	Other N=604	P-Value
Recurrent Hernia	9% (1783)	10% (1610)	6% (74)	8% (65)	6% (34)	**<0.001**[1]
No Mesh Used	7% (1297)	7% (1181)	4% (48)	6% (36)	7% (1297)	**<0.001**[1]
Operative Approach						
Open	42% (8201)					
Laparoscopic	31% (6113)					
Robotic	27% (5385)					
Indirect Hernia Size						**<0.001**[1]
I (<1.5cm or <1 fingertip)	17% (3272)	16% (2767)	17% (230)	18% (148)	21% (127)	
II (1.5-3cm or 1-2 fingertips)	41% (8167)	42% (7088)	38% (504)	38% (318)	43% (257)	
III (>3cm or >2 fingertips)	18% (3561)	18% (3018)	23% (306)	17% (145)	15% (92)	
Direct Hernia Size						**<0.013**[1]
I (<1.5cm or <1 fingertip)	8% (1621)	8% (1371)	9% (125)	9% (72)	9% (53)	
II (1.5-3cm or 1-2 fingertips)	17% (3363)	17% (2942)	13% (179)	18% (150)	15% (92)	
III (>3cm or >2 fingertips)	8% (1640)	8% (1427)	8% (109)	7% (59)	7% (45)	
Femoral Hernia Size						**<0.001**[1]
I (<1.5cm or <1 fingertip)	3% (622)	3% (559)	2% (28)	3% (21)	2% (14)	
II (1.5-3cm or 1-2 fingertips)	2% (319)	2% (299)	1% (8)	1% (10)	0% (2)	
III (>3cm or >2 fingertips)	0% (36)	0% (34)	0% (1)	0% (0)	0% (1)	
Operative time (minutes)						**<0.001**[1]
0 - 59	60% (11721)	61% (10258)	45% (606)	61% (508)	58% (349)	
60-119	36% (7037)	35% (5918)	46% (614)	34% (279)	37% (226)	
120-179	4% (748)	4% (600)	7% (91)	4% (36)	3% (21)	
180-230	1% (147)	1% (117)	1% (17)	1% (6)	1% (7)	
240 +	0% (42)	0% (32)	0% (6)	0% (3)	0% (1)	
Concomitant procedure performed	4% (708)	4% (609)	4% (58)	4% (31)	2% (10)	**0.032**[2]

Table 2: N is the number of nonmissing values. Numbers after proportions are frequencies. Tests used: 1Pearson test; 2Kruskal-Wallis test.

Results

- Racial differences in operative characteristics (white vs non-white)
  - Hernia size (larger in non-whites)
  - Mesh (used less in whites)
  - Operative time

Table 3. Primary Outcomes 30-day Follow-up

Variable	Combined N=19699	White N=16929	Black N=1334	Hispanic N=832	Other N=604	P-Value
Surgical Site Infection (SSI)	0% (25)	0% (21)	0% (1)	0% (2)	0% (1)	0.75[2]
Surgical Site Occurrence (SSO)	4% (884)	4% (722)	7% (97)	5% (44)	3% (21)	**<0.001**[2]
Post-op Complication (Any)	6% (1236)	6% (1016)	9% (125)	8% (63)	5% (32)	**<0.001**[2]
Readmission	1% (142)	1% (122)	1% (13)	1% (6)	0% (1)	0.28[2]
Hernia Recurrence	0% (32)	0% (28)	0% (2)	0% (1)	0% (1)	0.99[2]
Reoperation	0% (60)	0% (53)	0% (5)	0% (1)	0% (1)	0.67[2]

Table 3: a b c represent the lower quartile a, the median b, and the upper quartile c for continuous variables. N is the number of non-missing values. Numbers after proportions are frequencies. Tests used: 1Kruskal-Wallis test; 2Pearson test.

- Racial differences in 30-day operative outcomes
  - SSO/Any post-op complications
    - Greater in non-whites

Table 4. Secondary Outcomes 30-day & 1-year Follow-up

Variable	Combined N=19699	White N=16929	Black N=1334	Hispanic N=832	Other N=604	P-Value
Hernia Recurrence at 1-year	5% (179)	5% (160)	7% (11)	7% (5)	4% (3)	0.43[2]
EuraHS Overall Score (0-90)						
Baseline	13 27 45	13 26 44	16 37 56	21 36 54	12 26 45	**<0.001**[1]
30-day follow-up	4 12 27	3 11 26	6 17 36	8 25 41	4 17 32	**<0.001**[1]
1-year follow-up	0 1 5	0 1 5	0 2 11	0 3 12	0 2 9	**<0.001**[1]

Table 4: a b c represent the lower quartile a, the median b, and the upper quartile c for continuous variables. N is the number of non-missing values. Numbers after proportions are frequencies. Test used: 1Kruskal-Wallis test; 2Pearson Test.

- Racial differences in secondary post-operative outcomes
  - No difference in hernia recurrence at 1-year
  - Differences in EuraHS overall scores
    - Baseline, 30-day, 1-year follow-up
    - Lower in white vs non-white races

Results

Table 5. Linear Regression on 30-day & 1-year EuraHS overall score

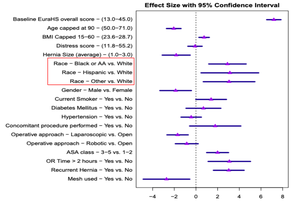


Table 5: Linear Regression on 30-day EuraHS overall score

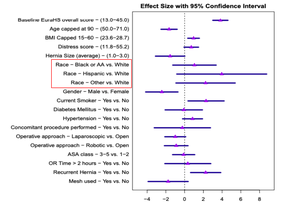


Table 5: Linear Regression on 1-year EuraHS overall score

- 30-day follow-up
  - Significant difference comparing white vs each non-white EuraHS overall scores
- 1-year follow-up
  - No difference in EuraHS scores

Conclusions

- Racial disparities in medicine and surgery exist
- Differences in post-operative outcomes after inguinal hernia repair based on race in this study were minimal, although disparities were still found in SSO/EuraHS
- Continued efforts are needed to eliminate racial disparities in health care

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