

Variations by Race in Obesity related Co-morbidities in Women prior to Gastric Sleeve

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Abstract

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Background: In the United States, morbid obesity is a major public health issue and every clinical insight helps manage these medically fragile individuals. The study objective was to identify racial variations in the clinical characteristics of morbidly obese women.

Hypothesis: Racial variations exist in clinical characteristics and co-morbid conditions of morbidly obese women.

Method: Data from 6,683 female patients pre-operative for sleeve gastrectomy from the Surgical Review Corporation's BOLD database was analyzed by race: African-American (n=810), Caucasian (n=4,929), Hispanic (n=582), Asian (n=20), and Other (Pacific Islander, Native American, or >1 race listed; n=344). Statistical analysis by ANOVA and Chi-squared.

Results: Caucasians were oldest (46+/-11 years, p<0.05), followed by Others, African-Americans. Hispanics and Asians were youngest (40+/-11, 40+/-7). African-Americans and Others had the highest BMIs (45+/-9, +/-10); followed by Hispanic, Caucasian, and Asians (p<0.05). The most common health insurance was Medicaid for Hispanics (17%), Medicare for Other (4.4%), Private for African-American (81%) and Self-Pay for Asians (32%), p<0.000. African-Americans had highest rates of CHF, hypertension, tobacco use, and unemployment (p <0.05). Caucasians were highest in cholelithiasis, GERD, alcohol use, mental health diagnoses, depression, psychological impairment, OSA, pulmonary hypertension, dyslipidemia, fibromyalgia, irregular menses, and stress incontinence (p<0.05). Hispanics had highest rates liver disease but lowest rates hypertension and leg edema (p<0.001). Asians had highest rates of abdominal panniculitis but had the lowest rates of alcohol use, cholelithiasis, GERD, dyslipidemia, OSA, fibromyalgia, mental health diagnosis, psychological impairment, somatic pain, pulmonary hypertension, and stress incontinence (p<0.05). Others were highest in leg edema and somatic pain, but lowest in panniculitis, depression, liver disease, irregular menses, tobacco use, and unemployment. Substance abuse was <1% in all groups.

Conclusion: The study results reveal that significant variations by race exist in Age, BMI, and many obesity-related co-morbidities. Having advanced knowledge of these racial differences can raise the clinician's index of suspicion for serious illnesses in obese women, resulting in earlier diagnoses and intervention that could optimize outcomes for morbidly obese women by race.

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Introduction

In the United States, obesity continues to be a major public health concern. As of 2010, more than one third of the adult population met the definition of obesity with body mass index (BMI) ≥30 kg/m and approximately 15 million of those had a BMI ≥40 kg/m [4]. The health consequences of obesity are substantial with a large body of evidence showing that increased body weight and body mass index (BMI) increase the risk of the development of chronic disease such as Type 2 Diabetes, cardiovascular disease, hypertension, stroke, and gallbladder disease, as well as cancers of the breast, endometrium, and colon. As a result, obesity itself is now considered a chronic medical condition and is one of the biggest drivers of healthcare costs in the United States; ranging from \$147 billion to nearly \$210 billion per year. These costs are attributable not just to obesity but to the treatment of obesity-related morbidities.

Objective

The goal of this study was to examine pre-operative clinical characteristics and the obesity-related comorbidities of women to determine if these health conditions are similar in all populations, or are more closely associated with a particular ethnicity.

Methods

The data from 6,683 female patients who were pre-operative for sleeve gastrectomy was obtained from the Surgical Review Corporation's database (BOLD) and was then analyzed retrospectively by race: African-American (n=810), Caucasian (n=4,929), Hispanic (n=582), Asian (n=20), and Other (Pacific Islander, Native American, or >1 race listed; n=344). Statistical analysis was performed by ANOVA and Chi-squared.

Conclusions

- Caucasians were the oldest (46+/-11 years, p<0.05), followed by Others (43+/-11), and African-Americans (42+/-11). Hispanics and Asians were the youngest (40+/-11, 40+/-7).
- African-Americans and Others had the highest BMIs (48+/-9, +/-10); followed by Hispanics (46+/-9), Caucasians (46+/-9), and Asians (40+/-7, p<0.05).
- African-Americans had highest rates of CHF, hypertension, tobacco use, and unemployment (p <0.05).
- Caucasians were highest in cholelithiasis, GERD, alcohol use, mental health diagnoses, depression, psychological impairment, OSA, pulmonary hypertension, dyslipidemia, fibromyalgia, irregular menses, and stress incontinence (p<0.05).
- Hispanics had highest rates liver disease but lowest rates hypertension and leg edema (p<0.001).
- Asians had highest rates of abdominal panniculitis but had the lowest rates of alcohol use, cholelithiasis, GERD, dyslipidemia, OSA, fibromyalgia, mental health diagnosis, psychological impairment, somatic pain, pulmonary hypertension, and stress incontinence (p<0.05).
- Others were highest in leg edema and somatic pain, but lowest in panniculitis, depression, liver disease, irregular menses, tobacco use, and unemployment. Substance abuse was <1% in all groups.
- Other co-morbidities measured but that showed no significant differences between racial groups include: DVT/PE, tobacco use, ischemic heart disease, back pain, pseudotumor cerebri, PCOS, gout, asthma, angina, glucose metabolism, PVD, functional status, OHS, and abdominal hernia

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Results

Pre-operative Clinical Characteristics				
Race	N	Age	Weight (kg)	BMI
African Am.	810	42(+/-11)	130.1	48 (+/-9)
Caucasian	4929	46 (+/- 11)	124.5	46 (+/-9)
Hispanic	582	40 (+/-11)	119.5	46 (+/-9)
Asian	20	40 (+/-7)	115.5	40 (+/-7)
Other	344	43 (+/-11)	129.2	48 (+/-10)
P-value	NA	0.05	0.05	0.05

Pre-operative Pulmonary Comorbidities					
Race	OSA	Pulm HTN	Obesity Hypoventilation	Asthma	DVT/PE
African Am.	36.05% (292/810)	3.33% (27/810)	1.23% (10/810)	18.02% (146/810)	2.1% (17/810)
Caucasian	37.92% (1869/4929)	4.4% (217/4929)	1.1% (54/4929)	16.39% (808/4929)	2.48% (122/4929)
Hispanic	34.36% (200/582)	1.55% (9/582)	0.52% (3/582)	18.21% (106/582)	2.23% (13/582)
Asian	15.0% (3/20)	0% (0/20)	0% (0/20)	25.0% (5/20)	0% (0/20)
Other	29.65% (102/344)	3.2% (11/344)	2.03% (7/344)	19.48% (67/344)	1.16% (4/344)
p-value	0.0031	0.0084	0.296	0.2983	0.5247

Pre-operative Cardiovascular Comorbidities							
Race	Ischemic heart diz	HLD	HTN	LE edema	CHF	Angina	PVD
African Am.	2.47% (20/810)	29.01% (235/810)	59.38% (481/810)	27.9% (226/810)	2.35% (19/810)	2.47% (20/810)	1.11% (9/810)
Caucasian	2.39% (118/4929)	39.52% (1948/4929)	52.1% (2568/4929)	27.63% (1362/4929)	1.14% (56/4929)	2.17% (107/4929)	0.93% (46/4929)
Hispanic	1.55% (9/582)	27.32% (159/582)	38.14% (222/582)	38.14% (111/582)	19.07% (69/582)	1.55% (9/582)	0.52% (3/582)
Asian	5% (1/20)	25% (5/20)	50.0% (10/20)	25.0% (5/20)	0% (0/20)	0% (0/20)	0% (0/20)
Other	1.74% (6/344)	32.27% (111/344)	43.6% (150/344)	43.6% (103/344)	29.94% (87/344)	0.87% (3/344)	0.29% (1/344)
p-value	0.5773	<0.0001	<0.0001	0.0003	0.0301	0.3418	0.5444

Pre-operative GI/GU and Endocrine Comorbidities						
Race	GERD	Cholelith.	Liver Dz.	Glucose metabolism	SUI	PCOS
African Am.	36.42% (295/810)	13.33% (108/810)	3.46% (28/810)	27.41% (222/810)	17.16% (139/810)	5.68% (46/810)
Caucasian	47.94% (2363/4929)	23.74% (1170/4929)	5.03% (248/4929)	27.84% (1372/4929)	29.13% (1436/4929)	6.92% (341/4929)
Hispanic	35.05% (204/582)	18.04% (105/582)	8.93% (52/582)	29.21% (170/582)	22.85% (133/582)	6.53% (38/582)
Asian	30.0% (6/20)	10.0% (2/20)	5.0% (1/20)	25% (5/20)	10.0% (2/20)	5.0% (1/20)
Other	43.9% (151/344)	14.53% (50/344)	1.45% (5/344)	20.64% (71/344)	27.03% (93/344)	3.78% (13/344)
p-value	<0.0001	<0.0001	<0.0001	0.0538	<0.0001	0.1666

Pre-operative Musculoskeletal Comorbidities					
Race	Abd Hernia	Abd. Skin Pannus	Musculosk.	Fibromyalgia	Back pain
African Am.	4.81% (39/810)	4.94% (40/810)	35.56% (288/810)	1.48% (12/810)	44.2% (358/810)
Caucasian	5.82% (287/4929)	9.31% (459/4929)	40.37% (1990/4929)	4.04% (199/4929)	45.63% (2249/4929)
Hispanic	4.3% (25/582)	5.5% (32/582)	31.79% (185/582)	1.55% (9/582)	41.24%(240/582)
Asian	5.0% (1/20)	10.0% (2/20)	25.0% (5/20)	0% (0/20)	30% (6/20)
Other	3.78% (13/344)	3.78% (13/344)	50.58% (174/344)	2.62% (9/344)	48.55% (167/344)
p-value	0.2551	<0.0001	<0.0001	0.0002	0.0991

Pre-operative Mental Health Comorbidities						
Race	Depression	Psych. Impairment	Mental Health Dx.	Substance abuse	Alcohol	Tobacco use
African Am.	21.48% (174/810)	10.86% (88/810)	6.42% (52/810)	0.37% (3/810)	32.35% (262/810)	4.81% (39/810)
Caucasian	42.5% (2095/4929)	21.18% (1044/4929)	13.96% (688/4929)	0.14% (7/4929)	35.04% (1727/4929)	7.32% (361/4929)
Hispanic	25.95% (151/582)	14.26% (83/582)	9.45% (55/582)	0.86% (5/582)	30.24% (176/852)	7.04% (41/582)
Asian	35.0% (7/20)	5.0% (1/20)	5.0% (1/20)	0% (0/20)	20.0% (4/20)	5.0% (1/20)
Other	18.9% (65/344)	9.01% (31/344)	5.81% (20/344)	0% (0/344)	20.64 (71/344)	3.2% (11/344)
p-value	<0.0001	<0.0001	<0.0001	0.0089	<0.0001	0.0061