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Background

- Alarming increase in obesity prevalence
 - In 2000 ~2/3 of all US had BMI values >25 kg/m²
- Some evidence that obesity worsens breast cancer prognosis & is associated with treatment-related complications
 - ↑ circulating endogenous peptide and steroid hormones & their binding factors
 - Aromatization of estrogens in fat tissue & ↑ insulin levels
 - 1.1 to 4.2 fold ↑ in risk of breast cancer recurrence or mortality in obese women (pre and postmenopausal women)
 - Stronger effect in postmenopausal women & earlier stages
- Unknown whether treatment differences by obesity status may account for differences in prognosis

Objective

- Compare whether receipt of appropriate primary breast tumor therapy &/or adherence to systemic adjuvant therapy differs by body mass index (BMI) status in older women with early stage breast cancer

Methods

- Cancer Research Network's Breast Cancer Treatment Effectiveness in Older Women (BOW) study
 - Stage I (70%) or II (30%) breast cancer diagnosed between 1990-1994
 - N=480 women ≥65 years with available BMI
 - 5 integrated health delivery systems
 - Group Health, Seattle, WA
 - Fallon, Worcester, MA
 - Henry Ford, Detroit, MI
 - Kaiser Permanente, Southern California
 - HealthPartners, St Paul, MN
- ACS study: N=417 women ≥65 years diagnosed between 1996-1999 with stage I (74%) or II (26%) breast cancer at Group Health
- Same medical record abstraction for both studies to confirm demographics, tumor characteristics, treatment, comorbid conditions, BMI

Exposure and Outcomes

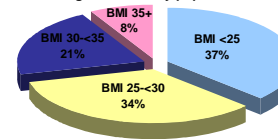
- Exposure: body mass index at diagnosis
 - Normal: <25 kg/m²
 - Overweight: 25-<30 kg/m²
 - Obese I: 30-<35 kg/m²
 - Obese II/III: ≥35 kg/m²
- Outcome based on national clinical guidelines for treatment:
 - Primary tumor therapy = 1) Mastectomy or 2) breast conserving surgery + axillary node dissection + any radiation (76% overall)
 - Adjuvant therapy: any receipt of tamoxifen, chemotherapy or both (40% overall)

Statistical Analysis

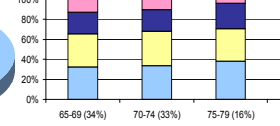
- Multivariable logistic regression to quantify the relation between BMI & therapy received. Covariates included in the model limited to factors associated with treatment outcome and BMI:
 - Covariates considered: age, stage, grade, estrogen and progesterone receptor status, Charlson comorbidity index at diagnosis, race/ethnicity, year of diagnosis
 - Primary therapy: age, site, study (BOW/ACS), stage (I/II) & comorbidity (0/1/2+)
 - Adjuvant therapy: age, site, study (BOW/ACS) & stage (I/IIA/IIB)

Results

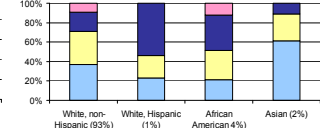
BMI at diagnosis in study population



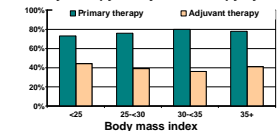
Body Mass Index by Age Group



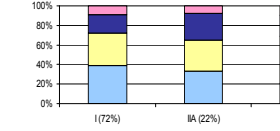
Body Mass Index by Race/Ethnicity



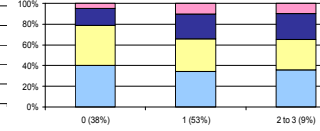
Primary therapy & Adjuvant therapy by BMI



Body Mass Index by Stage at Diagnosis



Body Mass Index by Charlson Comorbidity



Multivariable odds of receiving appropriate primary therapy or adjuvant therapy by BMI

	OR (95% CI)	OR (95% CI)
BMI at diagnosis (kg/m ²)		
<25	Referent	Referent
25-<30	1.07 (0.70, 1.62)	1.18 (0.83, 1.66)
30-<35	1.18 (0.71, 1.95)	1.22 (0.82, 1.83)
≥35	0.74 (0.37, 1.47)	1.02 (0.58, 1.77)
p-value	0.66	0.71
Continuous BMI	0.99 (0.96, 1.02)	1.01 (0.98, 1.04)
p-value	0.55	0.54

*adjusted for study, site, age (65-69, 70-74, 75-79, 80+), stage (I/II), Charlson index (0/1/2+)

†adjusted for study, site, age (65-69, 70-74, 75-79, 80+) & stage at diagnosis (I/IIA/IIB)

Summary

- Obesity status at diagnosis had no relation to receipt of guideline primary tumor therapy or adjuvant therapy
 - Unknown whether integrated delivery systems have less treatment variability by obesity status than other types of health plans
 - If there are differences in rates of recurrence and/or breast cancer mortality in this cohort by obesity (as has been seen in other observational cohort studies), treatment differences will be an unlikely explanation