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Cardiometabolic Risk Factors between Postmenopausal Women with and without Breast Cancer

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Cardiovascular Disease (CVD) in Women with Breast Cancer (BC)

- Female BC survivors are the largest (23%) cancer group in the U.S.
  - Postmenopausal women with early stage, hormone receptor-positive BC
  - Burden of comorbidity on CVD and all-cause mortality
- CVD is the leading cause of death among older BC survivors
  - Aging
  - Pre-existing comorbidities – hypertension, obesity, hyperlipidemia, diabetes, etc.
  - (Successful but) Cardiotoxic therapies of BC – multimodal regimens than a single agent/therapy
  - Poor health screening and surveillance during BC treatment and follow-up – ignorance about health issues and comorbidities other than BC among patients and physicians

Cardiometabolic Risk & Menopause

- Menopause (i.e., deficiency of sex hormones) increases cardiometabolic risk in older women
  - Increased [central] adiposity
  - Increased insulin resistance
  - Impaired lipid metabolism
  - Increased atherosclerosis
- Metabolic syndrome (MetS) – 3 of the 5 following components
  - Waist circumference ≥ 88cm
  - Fasting glucose ≥ 100 mg/dL or glucose-lowering medication
  - Triglycerides ≥ 150 mg/dL or lipid-lowering medication
  - HDL (high-density lipoprotein) cholesterol ≤ 50 mg/dL or lipid-lowering medication)
  - Blood pressure ≥ 130/85 mmHg or blood pressure-lowering medication

Metabolic Syndrome in Women with BC

- Cardiometabolic risk factors – BC risk
- BC treatment – Cardiometabolic risk
- A common shared pathway of altered insulin sensitivity and sex hormonal changes
- Cardiometabolic risk – CVD mortality and all-cause mortality
- Very limited comparative data/studies on the prevalence of MetS in postmenopausal women with BC compared to postmenopausal cancer-free women

Study Aim

- To examine the association of BC survivorship with MetS among postmenopausal BC survivors and cancer-free women (i.e., healthy comparison)

Methods

- A descriptive, correlational, pilot study
- A convenience sample of 102 postmenopausal women, including 64 BC survivors and 38 cancer-free women
  - Recruited through the UPMC Cancer Center and the University of Pittsburgh communities and by public announcement
- Data collection
  - Twice over a 6-month
  - Self-report questionnaires, physical assessments, medical record reviews, and fasting blood draws
  - MetS components were determined by the averages of two values over 6 months
  - Waist circumference, blood pressure, lipid panel and glucose

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Data Analysis & Findings

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Sample Characteristics

- Women with BC (mean age = 62, 46-81 years)
  - Early-stage (stage 1 or 2), hormone receptor (+) BC – Surgery + Aromatase Inhibitor (AI) endocrine therapy (100%) ± radiotherapy (78%) ± chemotherapy (52%)
  - Mean survival = 5.4 years (2-16 years)
  - Radiotherapy + AI: 34%
  - Chemotherapy + Radiotherapy + AI: (45%)
  - Completed AI therapy: 28%
  - Anastrazole (86%); Exemestane (17%); Letrozole (22%); ≥2 AIs (20%)
- Women without BC (mean age = 57, 44-74 years)
- No differences in demographics, reproductive factors, and health behaviors, except for age ($p < .001$), employment (retired vs. full time, $p < .001$), and C-reactive protein (CRP; 4.2 vs. 1.8 mg/dL, $p = .006$)

No significant difference in MetS between BC vs. no BC

	BC (n = 64)	No BC (n =38)	Total (N = 102)	p value
Hypertension (Dx/Tx or 130/85)	36 (56.3%)	10 (26.3%)	46 (45.1%)	**.003**
WC ≥ 88cm	32 (50.0%)	17 (44.7%)	49 (48.0%)	NS
Dyslipidemia (Triglyceride ≥ 150 mg/dL or HDL < 50 mg/dL or lipid-lowering medication)	24 (37.5%)	16 (42.1%)	40 (39.2%)	NS
Type 2 diabetes Dx/Tx or fasting glucose ≥ 100 mg/dL)	5 (7.6%)	4 (10.5%)	9 (8.7%)	NS
Metabolic syndrome (MS)	16 (25.0%)	4 (10.5%)	20 (19.6%)	NS
# of MS factors 0 1 2 3 ≥ 4	 16 (25.0%) 19 (29.7%) 13 (20.3%) 12 (18.8%) 4 (6.3%)	 9 (23.7%) 16 (42.1%) 9 (23.7%) 3 (7.9%) 1 (2.6%)	 25 (24.5%) 35 (34.3%) 22 (21.6%) 15 (14.7%) 5 (4.9%)	.075

No differences in individual components of MetS between BC vs. No BC

mg/dL, mean ± SD	BC (n = 35)	No BC (n = 33)
Total Cholesterol	201.6 ± 28.5	216.2 ± 42.0
LDL	123.5 ± 26.1	132.3 ± 36.7
HDL	59.9 ± 11.2	61.5 ± 12.5
Triglyceride	91.4 ± 37.4	100.8 ± 40.1
Glucose	89.8 ± 25.3	76.8 ± 13.5
n (%)		
HDL < 50	4 (11.4%)	5 (15.6%)
Triglyceride ≥ 150	3 (8.6%)	4 (12.5%)

	BC (n = 64)	No BC (n = 38)
Body mass index, kg/m^2	27.9 ± 6.1	26.6 ± 5.0
Waist circumference, cm	89.8 ± 14.9	86.5 ± 13.8
Systolic blood pressure, mmHg	123.9 ± 12.3	117.6 ± 10.8
Diastolic blood pressure, mmHg	77.1 ± 7.4	75.0 ± 8.2
n (%)		
Treated hypertension	26 (40.6%)	7 (18.4%)
Treated hyperlipidemia	19 (29.7%)	10 (15.6%)
Treated type2 diabetes	4 (6.3%)	2 (5.3%)

Conclusions

- Prevalence of MetS was higher in BC survivors with no statistical significance compared to healthy comparisons
- Postmenopausal women with and without BC showed an equally increased risk of cardiometabolic risk
  - Women with BC – hypertension (56.3 vs. 26.3%, p = .003)
  - Healthy comparisons - hyperlipidemia
- No significant associations between BC treatment and characteristics and MetS
- BC survivorship was not associated with MetS after controlling for age and CRP
- Identification and management of cardiometabolic risk factors should be incorporated into the standard care for aging women with BC

Limitations

- Convenience sampling
- Small sample size limited to one location
- Cross-sectional study design