

SIOG 2017 - Abstract Submission

Track 1: Solid tumours in the elderly and basic science

Breast

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ASSOCIATIONS OF PRE-CHEMOTHERAPY INFLAMMATION WITH POST-CHEMOTHERAPY FRAILTY IN PATIENTS WITH BREAST CANCER AGED 50+: LONGITUDINAL DATA FROM THE UNIVERSITY OF ROCHESTER NCI COMMUNITY ONCOLOGY RESEARCH PROGRAM (UR NCORP) NETWORK.

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I submit my abstract to be considered for the following award: None

Introduction: Frailty is an age-related syndrome characterized by weakness and fatigue that negatively affects quality of life. Previous studies have shown that chronic inflammation is a significant physiologic feature of frailty; as individuals age, there is immune dysregulation characterized by low grade inflammation (increased circulating Interleukin-6 (IL-6) and soluble Tumor Necrosis Factor Receptor (sTNFR) I&II). Whether these inflammatory markers are associated with frailty in patients who receive chemotherapy remains unknown.

Objectives: To determine if inflammatory cytokine levels pre-chemotherapy (pre-chemo) are predictive of post-chemotherapy (post-chemo) frailty in patients with breast cancer.

Methods: Female breast cancer patients aged 50+ scheduled to receive adjuvant/neoadjuvant chemotherapy (n=144) and age matched controls (n=142) were recruited from the UR NCORP network. Frailty was assessed by a modified frailty score (0-4) using self-reported weakness (≥ 4 on MD Anderson Symptom Inventory (SI)), exhaustion (≥ 4 on SI), physical activity (< 150 minutes/week on Aerobic Center Longitudinal Study Physical Activity Questionnaire (ACLS)) and walking speed (< 2 mph ACLS). Fasting blood was drawn at pre-chemo and post-chemo time points and sent to UR NCORP where serum cytokines were measured via Luminex multiplex assays. Age matched controls were assessed at equivalent time points. Chi-square tests were used to compare frailty between cancer patients and controls and between pre-chemo and post-chemo. T-tests were used to evaluate the associations between pre-chemo cytokine level (median as cutoff) and post-chemo frailty for patients and controls.

Results: Patients with stage I-IIIc breast cancer (mean age 60; range 50-76) and controls (mean age 59; range 50-81) were evaluated. Pre-chemo, a significant percentage of cancer patients were weaker (20% vs 6%, $p < 0.01$), more exhausted (33% vs 18%, $p < 0.01$), had lower physical activity (8% vs 3%, $p = 0.04$) and walked slower (56% vs 40%, $p < 0.01$) compared to controls. Comparing post-chemo to pre-chemo, a greater percentage of cancer patients were weaker (53% vs 20%, $p < 0.01$), more exhausted (63% vs 33%, $p < 0.01$), had lower physical activity (16% vs 12%, $p < 0.05$) and walked slower (77% vs 56%, $p < 0.01$), while controls did not have significant changes over time. Overall, cancer patients were more frail pre-chemo compared to controls (with frailty scores of 1.17 vs 0.65, $p < 0.01$) and were more frail post-chemo compared to pre-chemo (2.08 vs 1.17, $p < 0.01$). Cancer patients with pre-chemo levels of IL-6, sTNFR I and sTNFR II above the median were more frail after receiving chemotherapy than those with values below the median whereas this association was not seen in controls. (2.31 vs 1.86, $p = 0.03$; 2.30 vs 1.88, $p = 0.04$; 2.29 vs 1.87, $p = 0.04$).

Conclusion: Cancer patients 50+ are significantly more frail than age matched controls before treatment and chemotherapy exacerbates frailty in these patients. Higher than median pre-chemo levels of studied cytokines were significantly associated with frailty post-chemo in women aged 50+ with breast cancer. These results suggest that pre-chemo levels of inflammatory cytokines may help serve as a biomarker to determine which cancer patients will have greater frailty after chemotherapy. Future studies need to validate and expand these findings.

Disclosure of Interest: None Declared

Keywords: Breast Cancer, Frailty, Inflammation