00418 Leptin as a Potential Fatigue Biomarker for the Onset of Cancer-related Fatigue (CRF): A Prospective Cohort Study

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Aims: While leptin is known for its metabolic effects ranging from appetite suppression to increasing energy expenditure, it has also been characterized as an adipokine. Being pro-inflammatory, leptin is postulated to have a role in predicting onset of Cancer-Related Fatigue (CRF). This study aims to evaluate the correlation between leptin and CRF in early-stage breast cancer patients receiving chemotherapy.

Methodology: In a prospective cohort study, patients completed assessments at baseline (T1), during (T2) and after chemotherapy (T3). At each time point, plasma leptin level was measured using Luminex bead-immunoassay and the validated Multi-Dimensional Fatigue Symptom Inventory-Short form (MFSI-SF) was utilized to measure CRF. Data was longitudinally analysed using a Generalized Estimating Equation model, incorporating clinically relevant parameters and pro-inflammatory cytokines that were statistically associated with total MFSI-SF score.

Result: 136 patients were recruited (mean age ± SD = 51.5 ± 8.8 years; mean BMI of 23.9 kg/m2; 69.1% receiving anthracycline-based chemotherapy). More patients experienced CRF at T3 (22.1%) than at T2 (13.2%) compared to baseline. Median (± inter-quartile range) leptin level was 4.33 ± 2.82 ng/mL. Leptin inversely correlated with total MFSI-SF score (β = -0.56, $p < 0.01$), general (β = -0.16, $p < 0.01$), emotional (β = -0.11, $p < 0.01$) and mental sub-domains (β = -0.06, $p = 0.025$). In the final model, plasma leptin levels showed a statistically significant inverse correlation with total MFSI-SF score over time (β = -0.22, $p < 0.01$) after adjusting for anxiety, depression, insomnia, age, menopausal status and chemotherapy.

Conclusion: This is the first study to demonstrate leptin as a potential fatigue biomarker to predict the onset of CRF over time. The inverse correlation observed suggests that the underlying mechanism linking leptin to fatigue may be preceded by other non-inflammatory factors. Future studies are required to validate the findings and to evaluate the sensitivity and specificity to confer clinical utility.