Relationships of Emerging Biomarkers of Cancer Cachexia to Quality of Life and Appetite

P268

Lipshitz M,[1,2] Visser J,[1] Anderson R,[3] Nel DG,[4] Smit T,[5] Steel H,[3] Rapoport B[5,6]

[1]Division of Human Nutrition, Stellenbosch University, South Africa [2]Melanie Levy Dietician, Johannesburg, South Africa [3]Department of Immunology, University of Pretoria, South Africa [4]Centre for Statistical Consultation, Stellenbosch University, South Africa [5]The Medical Oncology Centre of Rosebank, Johannesburg, South Africa, [6]Department of Immunology, University of Pretoria, South Africa

Introduction and Aim

- **Quality of Life** (QoL) assessment and **anorexia** diagnosis are pivotal in cancer care and may independently predict survival.
- Cachexia research suggests that **biomarkers** of cachexia are related to a decline in QoL and increase in anorexia.
- The **ideal biomarker** for cachexia assessment, prognosis and blockade remains to be identified.
- Emerging biomarkers require **baseline research** of their relationships to both QoL and anorexia.
- The aim of the study was: i) to **establish differences** in biomarkers of cachexia, QoL and anorexia between patients with cancer cachexia and healthy matched controls, ii) to explore the relationships and correlations of these markers to QoL and appetite.

Long-term aim: to improve knowledge of the relationships between emerging biomarkers of cancer cachexia, QoL and appetite so that future treatments may target cachexia and ultimately prognosis.

Methods

- Prospective case-control study: including 40 patients with advanced cancer, mixed diagnoses and 40 gender, age-matched controls.
- QoL measured using the the European Organization for the Research and Treatment of Cancer Quality of Life-C30 assessment (EORTC-QLQ-C30) and anorexia assessed using the Functional Assessment of Anorexia / Cachexia Therapy assessment (FAACT A/CS-12).
- Biomarkers assessed: albumin, haemoglobin (Hb), neutrophils, lymphocytes, platelets, C-reactive protein (CRP), tumor necrosis factor alpha (TNFα), Interleukin-6 (IL-6), Interleukin-8 (IL-8), C-X-C motif chemokine ligand 5 (CXCL5) and citrullinated histone H3 (H3Cit).
- Descriptive statistics and regression analyses for correlations were undertaken.

Results

- The cases scored significantly lower FAACT A/CS-12 scores than the controls, p<0.01, with 30% of cases scoring an overall “poor” appetite (**Figure 1).**
- For all sectors of QoL [Global Status (QL-G), Functional Scales (QL-FS) and Symptom Scales (QL-SS)] cases scored significantly different (p<0.01) compared to reference values. Lower scores for QL-G and QL-FS and higher scores doe QL-FS.
- Albumin, lymphocytes, platelets, Hb, platelet to lymphocyte ratio (PLR), systemic immune-inflammation index (SII), CRP, TNFα (all at p<0.01) and neutrophil to lymphocyte ratio (NLR) (p=0.02), IL-6 (p<0.04) and IL-8 (p=0.02) were significantly different between cases and controls.
- No difference was found for CXCL5 (p=0.22) or H3Cit (p=0.99) between the groups.
- Albumin (p=0.03) and CRP (p=0.002) were significantly associated to appetite categories “good”, “moderate” and “poor” **(Figure 2).**

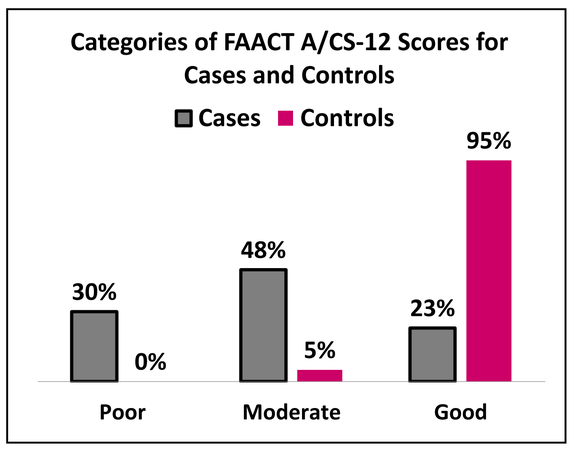

Figure 1: FAACT A/CS-12 Categories

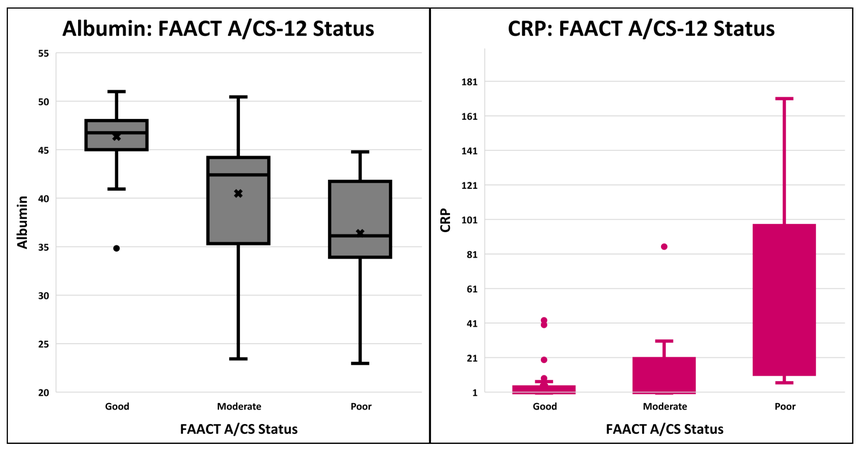

Figure 2: Albumin and CRP Correlations to FAACT A/CS-12 Categories

- NLR, PLR, SII, CXCL5, TNFα, IL-6 and CRP showed significance to FAACT A/CS-12 using categories and cut-offs for biomarkers.H3Cit and IL-8 showed no significance **(Table 1).**
- Only albumin, NLR, Hb, PLR, SII, TNFα, IL-8 and CRP showed significant correlations to all three QoL sectors **(Table 2).**
- Using cut-offs for biomarkers and QL-FS, CXCL5 was significantly correlated to QL-FS, p=0.04 **(Figure 3).**

Table 1:
Results of Biomarker and FAACT A/CS-12 Score Category Analysis

Biomarker	Significance
NLR	P < 0.01
PLR	P < 0.01
SII	P = 0.01
CXCL5	P = 0.04
TNFα	P < 0.01
IL-6	P < 0.01
CRP	P < 0.01

Table 2 :
Biomarkers with Significant Correlations to QoL Sectors

Biomarker	QoL-G	QoL-FS	QoL-SS
Albumin	+	+	-
Hb	+	+	-
NLR	-	NO SIG	+
PLR	-	-	+
SII	-	-	+
TNFα	-	-	+
IL-8	-	-	+
CRP	-	-	+

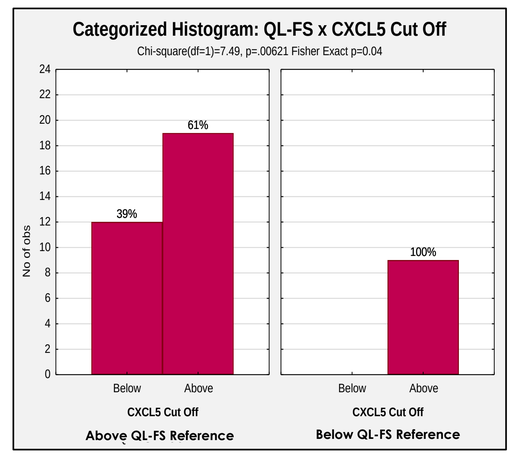

Figure 3: CXCL5 Correlations to QL-FS

- FAACT A/CS-12 scores showed significant associations to NLR (p=0.002), Hb (p < 0.001) and PLR (p <0.01). No other biomarkers showed significance to FAACT A/CS-12 scores when using continuous variables for both appetite scores and biomarkers.

Conclusions

- **CRP, albumin & haemoglobin consistently showed baseline differences between cases & controls & in further correlations to QoL & appetite.**
- **NLR, PLR, SII, TNFα, IL-6 and IL-8 showed inconsistent correlations of significance to QoL & appetite dependent on statistical methods applied.**
- **Emerging biomarkers CXCL5 & H3Cit were not found to be reliable biomarkers for cancer cachexia in defining correlations to QoL & appetite.**