# Cancer cachexia: relation between nutritional status by strength in patients in palliative care

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## BACKGROUND

Cancer cachexia is a syndrome often observed in advanced cancer patients driven by several factors that is common to cancer metabolism, characterizing a wasting loss and possibly strength.

## AIM

The aim of this study was to test the association between cancer cachexia with abridged patient-generated subjective global assessment (aPG-SGA) and muscle strength by hand grip strength (HGS) in patients in palliative care.

## METHODS

This is an observational study comprising 525 patients attended for the first time at Palliative Care Unit of the National Cancer Institute José Alencar Gomes da Silva (INCA), with different locations of tumor [Gastrintestinal (GI) tract (31.8%)]. Cachexia was defined by the criteria described for Fearon et al. (2011): 1) Weight loss above 2% in 6 months in addition to body mass index (BMI) < 20kg/m²; or 2) Weight loss above 2% in 6 months in addition to low muscle mass, evaluated through the Mid-upper arm muscle area < 32cm² for male and < 18cm² for female. Muscle strength was evaluated by a mechanical dynamometer and reduced muscle strength was characterized by HGS < 20kg for female and < 30kg for male. Associations with aPG-SGA and muscle strength was tested by univariate and multivariate losgistic regression.

## RESULTS

Patients presented a median age around sixty decade of life [63 (54;72, Interquartile range) years]. Most of then were female (57.5%). Low values (< 50%) of Karnofsky Performance Status (KPS) and serum albumin < 3,5g/dl was observed in 50% and 60% of patients, respectively. High C-reactive protein (CRP) ⩾ 10mg/dl was also found in 60%. Cachexia was present in 320 of the patients (61%) and low BMI in 37%. The prevalence of low HGS was found in 74% and 79% of males and females, respectively (Table 1). Patients with cachexia presented worst nutritional status by aPG-SGA and lower HGS compared with those without (Figure 1). In the univariate logistic regression a significant and elevated Odds Ratio (OR) for cachexia was observed for GI tract tumor and KPS < 50% , serum albumin <3.5g/dL, HGS and moderate and severe malnutrition by aPG-SGA. In the multivariate analysis malnutrition by aPG-SGA presented the highest OR (6.39 [CI 95%: 3.65;11.18]) against the others parameters that remained significant: gender, GI tract tumor, and KPS (Table 2).

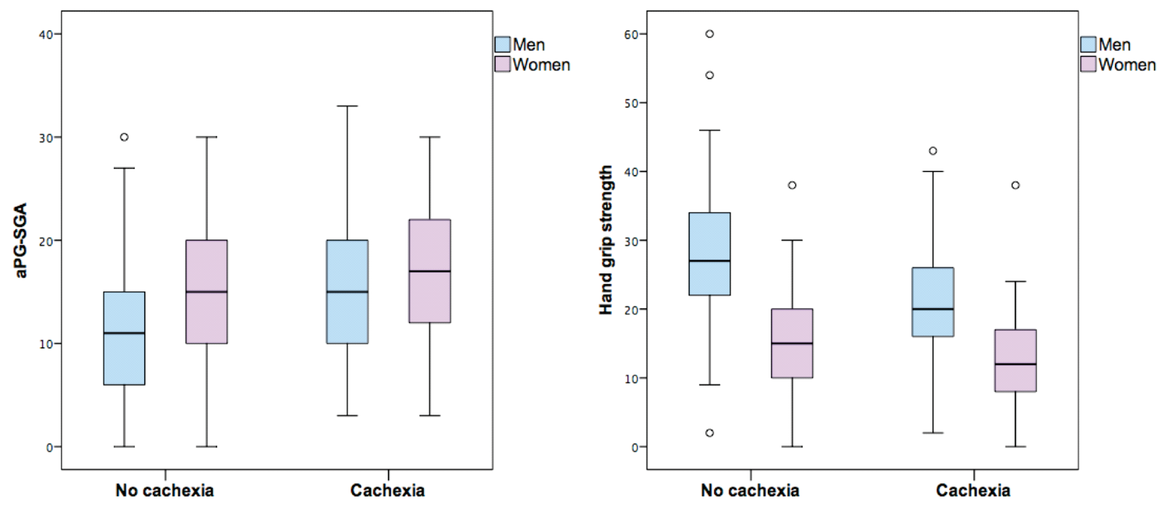


**Figure 1.** Box-plots of abridged Patient-Generated Subjective Global Assessment (aPG-SGA) and Handgrip Strength compared to cancer cachexia in patients treated at a Palliative Care Unit in the city of Rio de Janeiro- Brazil (n=525).
Note: aPG-SGA: No cachexia ≠ Cachexia (Male, p-value <0.001; Female, p-value = 0.001).
Hand grip strength: No cachexia ≠ Cachexia (Male, p-value <0.001; Female, p-value = 0.003).

**Table 1**. Clinical and demographic characteristics of 525 patients treated at a Palliative Care Unit in the city of Rio de Janeiro- Brazil

| Characteristics (n=525) | N (%) |
|---|---|
| Age years* | 63 (54; 72) |
| Female | 302 (57,5) |
| Tumor localization | |
| Gastro Intestinal | 167 (31,8) |
| Ginecologycal | 95 (18,1) |
| Lung | 61 (11,6) |
| Mama | 54 (10,3) |
| Head and neck | 53 (10,1) |
| Others | 95 (18,1) |
| Co-morbidities | |
| Hypertension | 143 (27,2) |
| Diabetes *mellitus* | 50 (9,5) |
| BMI < 20Kg/m² | 196 (37,3) |
| KPS< 50% | 260 (49,5) |
| Albumin (<3,5g/dL) | 315 (60) |
| CPR (≥10mg/dL) | 321 (61,1) |
| Caquexia | 252 (48) |
| Hand Grip Strengh | |
| Male (<30 kg/m²) | 159 (74) |
| Female (<20 kg/m²) | 228 (78,9) |

**Table 2.** Factors associated with cachexia in patients with advanced cancer treated at a Palliative Care Unit in the city of Rio de Janeiro- Brazil (n=525).

| | Univariate | | Multivariate | |
|---|---|---|---|---|
| Variables | OR (CI 95%) | p-value[a] | OR (CI 95%) | p-value[a] |
| Age ≥ 60 years | 1.08 (0.76; 1.53) | 0.667 | | |
| Female gender | 0.33 (0.23; 0.48) | <0.001 | 0.29 (0.19; 0.43) | <0.001 |
| Types of tumor (GI Tract) | 2.17 (1.49; 3.16) | <0.001 | 1.82 (1.20; 2.76) | 0.004 |
| KPS (< 50%) | 1.81 (1.27; 2.56) | 0.001 | 1.55 (1.04; 2.32) | 0.030 |
| CRP (> 10 mg/l) | 1.42 (0.96; 2.10) | 0.075 | | |
| Albumin (< 3,5 g/dl) | 1.56 (1.08; 2.25) | 0.016 | | |
| aPG-SGA B+C | 4.63 (2.76; 7.77) | <0.001 | 6.39 (3.65; 11.18) | <0.001 |
| HGS | 2.43 (1.57; 3.77) | <0.001 | | |

**Note:** OR = odds Ratio; CI = confidence Interval; GI= gastrointestinal; KPS= Karnofsky Performance Status; CRP= C-reactive protein; aPG-SGA= abridged Patient-Generated Subjective Global Assessment; HGS = hand grip strength.
ap-value refers to univariate logistic regression

## CONCLUSION

Low KPS, GI tract tumor, moderate and severe malnutrition according to aPG-SGA, but not muscle strength evaluated for HGS were associated with an increased odds to present cachexia. Further investigations in advanced cancer patients are still necessary to support these associations observed for the HGS.

Projeto Gráfico: Setor de Edição e Informação Técnico-Científica / INCA