PREDICTORS OF FAT INFILTRATION INTO THE SKELETAL MUSCLE IN ENDOMETRIAL CANCER PATIENTS

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INTRODUCTION

Fat infiltration into the skeletal muscle (SM) can be identified by the low-radiodensity of this tissue and has been associated with conditions such as diabetes[1], sedentary lifestyle[2] and obesity[3]. In addition, high amounts of low-radiodensity SM determines worse clinical outcomes in oncologic patients[4,5]. However, the predictors of SM radiodensity in cancer patients have not been studied. Thus, the objective of this study was to determine the predictors of fat infiltration into the SM in endometrial cancer patients.

METHODS

RETROSPECTIVE COHORT STUDY

- Patients with endometrial cancer admitted between 2008-2016 (n=447)
- Computed tomography images available prior to oncologic treatment → Third lumbar vertebra (L3)
- Clinical-pathological features and sociodemographic → medical records
- ▪ Multiple logistic regression → predictors of fat infiltration into the SM (LRSMI) → above 3rd quartile
  ▪ Statistically significant → $p < 0.05$

- ▪ Skeletal muscle index (SMI) → -29 a +150 Hounsfield Units → Low SMI defined as <38.9 cm²/m²
- ▪ Low-radiodensity skeletal muscle index (LRSMI) → -29 a +29 Hounsfield Units
- ▪ High-radiodensity Skeletal Muscle Index (HRSMI) → +30 a +150 Hounsfield Units
- ▪ Average Muscle Radiation Attenuation (AMA)

RESULTS

Table 1. Patient sociodemographic, clinical and skeletal muscle parameters (n=447).

Characteristic	n (%)	Characteristic	n (%)
Age category		**Tumour Grade[2]**	
<65 years	219 (49.0)	I	79 (20.7)
≥ 65 years	228 (51.0)	II	126 (33.0)
Ethnic group		III	177 (46.3)
Caucasian	223 (49.9)	**Stage[3]**	
Mixed	150 (33.6)	I	169 (39.6)
Black	74 (16.6)	II	47 (11.0)
Comorbidity		III	113 (26.5)
No	113 (25.3)	IV	76 (17.8)
Yes	334 (74.7)	**Skeletal Muscle Index (SMI), <38,9 cm²/m²**	
Comorbidity type		No	328 (73.4)
Hypertension	311 (93.1)	Yes	119 (26.6)
Diabetes	126 (37.7)	**Low Radiodense Skeletal Muscle Index (LRSMI), cm²/m²**	
Hypertension + Diabetes	115 (34.4)	Quarlite 1	16.84
Others	33 (9.8)	Quartile 2	22.30
Histological type		Quartile 3	26.94
Adenocarcinoma	386 (86.4)	**Body Mass Index (BMI)[4], Kg/m²**	
Sarcoma	61 (13.6)	Underweight	48 (11.0)
Histological Subtypes[1]		Normal range	108 (24.7)
Endometrioid	221 (55.8)	Overweight	94 (21.5)
Mixed	75 (18.9)	Obese	188 (42.9)
Serous	59 (14.9)	**Fasting glucose[5]**	
Clear cell	26 (6.6)	<99	141 (39.1)
Others	15 (3.8)	≥100	220 (60.9)

[1] Histological Subtypes (n=396); [2] Tumour Grade (n=382); [3] Stage (n=427); [4] Body Mass Index (n=438); [5] Fasting glucose (n=391)

Table 2. Multiple logistic regression for the predictors of fat infiltration into the skeletal muscle.

	Univariate			Multivariate		
	OR	**IC 95%**	**p valor**	**OR**	**IC 95%**	**p valor**
Age category						
<65 years	Reference	-	Reference	-	-	-
≥65 years	2.11	1.36 – 3.28	0.001	2.12	1.19 - 3.76	0.010
Diabetes	2.98	1.89 – 4.69	0.000	2.15	1.20 - 3.87	0.011
Hypertension	3.70	1.98 – 6.91	0.000	1.72	0.80 - 3.70	0.162
Body Mass Index (BMI)						
Underweight and normal range	Reference	-	Reference	-	-	-
Overweight	1.16	0.51 – 2.62	0.721	1.71	0.65 - 4.49	0.276
Obese	7.22	3.99 – 13.05	0.000	6.09	3.02 - 12.29	0.000
Fasting glucose						
<99	Reference	-	-	Reference	-	-
≥100	2.50	1.47 – 4.23	0.001	1.44	0.77 - 2.69	0.250

CONCLUSION

The predictors of high amounts of LRSMI in endometrial cancer patients are similar to those found in the healthy population. Considering the negative impact of LRSMI in cancer prognosis intervention strategies focused on improving the quality of the SM in this population are mandatory.

Footnote: There was no funding source.

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

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