

# The impact of sarcopenia and frailty phenotype on health related quality of life of colorectal cancer patients

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## INTRODUCTION

Sarcopenia and frailty are overlapping syndromes, both are associated with aging and disease, increasing the risk of adverse events such as physical disability, reduction in health related quality of life (HRQL) and death. The aim of the study was to evaluate the influence of sarcopenia and frailty phenotype on HRQL of colorectal cancer patients.

## METHOD

Cross sectional study including adult ( $\geq 20$ y) colorectal cancer patients. Clinical and nutritional data were collected. Sarcopenia was defined as low skeletal muscle mass  $<6.76 \text{ kg/m}^2$  for women and  $<10.76 \text{ kg/m}^2$  for male patients assessed by bioelectrical impedance analysis. Frailty was defined by Fried et al (2001) as the presence of 3 or more of the following criteria: unintentional weight loss ( $>3 \text{ kg}$  in past year), self-reported exhaustion, weakness (low handgrip strength), slow walking speed (gait speed) and low physical activity (IPAQ questionnaire). HRQL was assessed using the EORTC QLQ-C30 questionnaire. The SPSS program, version 20.0, was used for statistical analysis (Student T or Mann-Whitney test; ANOVA with Bonferroni pos-hoc test,  $\chi^2$  test or Fisher's exact test, linear regression). P-values  $<0.05$  were considered statistically significant. The study was approved by the appropriate ethics committee (CAEE 54778216.7.0000.5274).

## RESULTS

73 patients (age  $63.9 \pm 11.3 \text{ y}$ ) were included; 46.8% were sarcopenic and 19.2% frail (Table 1). There was no difference in HRQL when compared sarcopenic patients with non-sarcopenic patients, however, the frail patients presented worse HRQL when compared to non-frail patients in Global Health Status; Role Function; Physical Function; Fatigue; Nausea/vomiting and Appetite lost (Table 2). The regression model adjusted by age, sex, BMI, cancer stage and sarcopenia showed that be frail was associated with worse Global Health Status; Role Function; Physical Function and Fatigue (Table 3).

**Table 1.** Clinical and Nutritional parameters of colorectal cancer patients (N=73).

Variables	N (%)
Tumor location	
Colon	43 (58.9)
Rectum	30 (41.1)
Stage of the disease	
Initial	69 (94.5)
Advanced	4 (5.5)
Moment of treatment	
During	40 (54.8)
After	33 (45.2)
Nutritional Status	
BMI, $\text{kg/m}^2$ - Mean ( $\pm$ SD)	26,8 ( $\pm$ 5.1)
Sarcopenia	34 (46.8)
Frailty Phenotype	
Robust	19 (26.0)
Pre-Frail	40 (54.8)
Frail	14 (19.2)

Notes: SD – Standard Deviation, BMI – Body Mass Index.

**Table 2.** Health related Quality of Life and Frailty of colorectal cancer patients.

HRQL	Robust (n=19)	Pre-frail (n=40)	Frail (n=14)	p-value (ANOVA)
	Mean ( $\pm$ SD)	Mean ( $\pm$ SD)	Mean ( $\pm$ SD)	
Global Health Status	86,8 ( $\pm$ 13,7)	78,3 ( $\pm$ 18,0)	64,9 ( $\pm$ 27,0)*	<b>0,005</b>
Role Function	92,1 (17,0)	82,5 ( $\pm$ 20,6)	46,4 ( $\pm$ 38,2)*#	<b>&lt;0,001</b>
Physical Function	90,2 ( $\pm$ 14,3)	87,3 ( $\pm$ 18,3)	55,7 ( $\pm$ 29,4)*#	<b>&lt;0,001</b>
Emotional Function	74,6 ( $\pm$ 29,3)	63,1 ( $\pm$ 34,4)	44,0 ( $\pm$ 41,0)*	<b>0,04</b>
Cognitive Function	90,4 ( $\pm$ 12,8)	81,2 ( $\pm$ 25,4)	77,4 ( $\pm$ 24,1)	0,32
Social Function	78,1 ( $\pm$ 25,5)	78,3 ( $\pm$ 24,1)	60,7 ( $\pm$ 35,6)	0,26
Fatigue	9,4 ( $\pm$ 14,0)	14,7 ( $\pm$ 19,9)	43,6 ( $\pm$ 32,4)*#	<b>&lt;0,001</b>
Nausea/vomiting	0,9 ( $\pm$ 3,8)*	0,8 ( $\pm$ 3,7)	11,9 ( $\pm$ 19,0)*#	<b>0,002</b>
Pain	13,2 ( $\pm$ 26,4)	22,5 ( $\pm$ 34,7)	40,5 ( $\pm$ 40,1)*	<b>0,07</b>
Dyspnea	1,8 ( $\pm$ 7,6)	8,3 ( $\pm$ 23,6)	9,5 ( $\pm$ 27,5)	0,93
Insomnia	8,8 ( $\pm$ 15,1)	35,0 ( $\pm$ 43,3)	35,7 ( $\pm$ 42,3)*	<b>0,05</b>
Appetite lost	0	15,8 ( $\pm$ 30,2) #	35,7 ( $\pm$ 42,3)*#	<b>0,002</b>
Constipation	0	7,5 ( $\pm$ 24,4)	21,4 ( $\pm$ 33,6)*#	<b>0,03</b>
Diarrhea	7,0 ( $\pm$ 21,0)	13,3 ( $\pm$ 29,0)	21,4 ( $\pm$ 38,4)	0,50
Financial Difficulties	33,3 ( $\pm$ 38,5)	34,2 ( $\pm$ 37,4)	38,1 ( $\pm$ 43,1)	1,00

Notes: SD – Standard Deviation, HRQL – Health related quality of life; p-value by ANOVA, \*Frail x Robust, #Frail x Pre-Frail.

**Table 3.** The association between Frailty Phenotype and HRQL using multivariable linear regression in colorectal cancer patients.

Model	Physical Function	Role Function	Fatigue	Global Health Status
<b>Robust vs.</b>				
<b>Pre-frail +</b>	-1,5 (-3,9/10,9) <sup>NS</sup>	-14,0 (-29,6/1,7) <sup>NS</sup>	3,8 (-9,1/16,7) <sup>NS</sup>	-8,1 (-20,1/4,0) <sup>NS</sup>
<b>Frail</b>				
<b>Robust +</b>				
<b>Pre-frail vs</b>	-22,6 (-36,9/-8,3) <sup>b</sup>	-34,6 (-52,4/-16,8) <sup>b</sup>	24,9 (10,2/39,6) <sup>b</sup>	-17,8 (-32,3/-3,3) <sup>a</sup>
<b>Frail</b>				

Notes: HRQL – Health related quality of life; NS: not significant  
Results expressed as unstandardized beta (95% confidence interval (CI)).  
# Adjusted for age, sex, cancer stage, BMI, sarcopenia (decreased muscle mass).  
a p <0.05  
b p <0.01

## CONCLUSION

Although, Sarcopenia was not associated with HRQL, Frailty was an independent predictor of worse HRQL in colorectal cancer patients.

## REFERENCES

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