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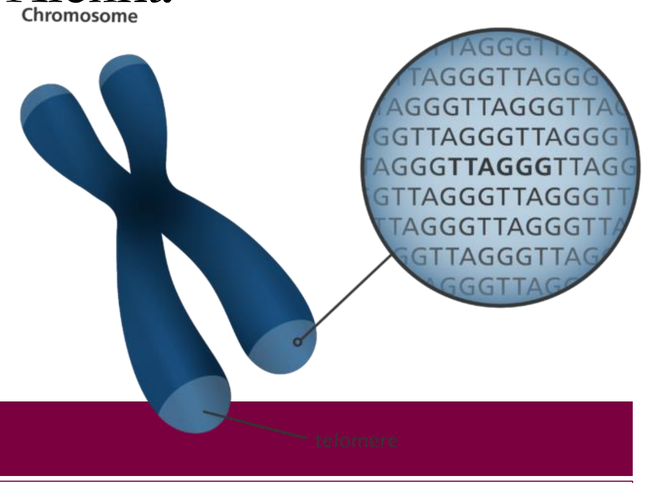
TELOMERE LENGTH SHORTENING IN ELDERLY WITH SARCOPENIA AND FRAILTY

L. Jurkūnaitė[1], V. Ginevičienė[1], E. Pranckevičienė[1,2], A. Urnikytė[1], R. Dadelienė[1], J. Kilaitė[1], I-E. Jamontaitė[1], A. Mastavičiūtė[1], I.I. Ahmetov[1, 3], V. Alekna[1]

[1]Faculty of Medicine, Vilnius University, Vilnius, Lithuania
[2]Faculty of Informatics, Vytautas Magnus University, Kaunas, Lithuania
[3]Liverpool John Moores University, Liverpool, United Kingdom

laura.jurkunaite@gmc.stud.vu.lt



INTRODUCTION

In response to an aging society, there is a growing interest in research on the cellular and molecular mechanisms of aging. Telomere shortening is considered one of the potential molecular causes of the risk of developing age-related pathologies. Sarcopenia and frailty are overlapping geriatric syndromes that, due to reduced muscle mass, strength, and functional capacity, lead to impaired quality of life, increased morbidity and mortality in older adults. However, the pathogenesis and molecular mechanisms of these syndromes remain poorly understood. Therefore, **the aim of this study** was to investigate the properties of leukocyte telomere length in older adults with sarcopenia and frailty.

METHODS

This study included 197 older adults (43 male and 153 female, aged 82.2±7.6 years): 121 individuals with sarcopenia and/or frailty (26 male and 95 females, aged 85.3±6.7 years) and 75 community-dwelling older adults (17 male and 58 female, aged 80.2±7.5 years) without sarcopenia and/or frailty. Sarcopenia was confirmed according to the European Working Group on Sarcopenia in Older People (EWGSOP) guidelines, and frailty was assessed by Fried's criteria. Phenotypic data were collected via the questionnaires, scales, and testing of physiological characteristics. Statistical analysis was performed using R Studio (version 4.3.1).

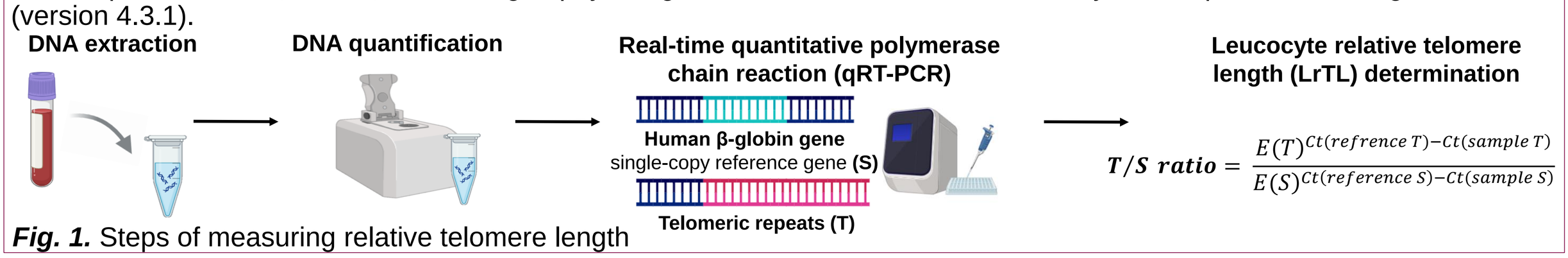


Fig. 1. Steps of measuring relative telomere length

RESULTS

	Relative telomere length (T/S ratio)					
	Unadjusted mean (95 % CI)	p	Adjusted mean (95 % CI)[a]	p	Adjusted mean (95 % CI)[b]	p
Healthy older adults (n = 75)	0.479 (0.431–0.539)		0.435 (0.368–0.509)		0.374 (0.286–0.462)	
Sarcopenia and/or frailty (n = 121)	0.345 (0.310–0.380)	**0.002**	0.360 (0.311–0.410)	0.051	0.361 (0.281–0.441)	0.746
Sarcopenia (n = 93)	0.347 (0.304–0.391)	**0.004**	0.368 (0.311–0.425)	0.126	0.371 (0.277–0.465)	0.953
Frailty (n = 90)	0.308 (0.274–0.342)	**p < 0.001**	0.330 (0.275–0.385)	**0.005**	0.344 (0.263–0.425)	0.253

Table 1. LrTL differences in older adults by sarcopenia and frailty status

[a]adjusted for age and gender
[b]adjusted for age, gender, smoking and PASE score

The average LrTL in older adults participating in this study was 0.408±0.262 T/S units, with no significant gender differences in LrTL.

Elderly participants with LrTL below the average had higher odds of having sarcopenia and/or frailty compared to those with LrTL above the average (OR = 4.51; 95% CI 2.22–9.18).

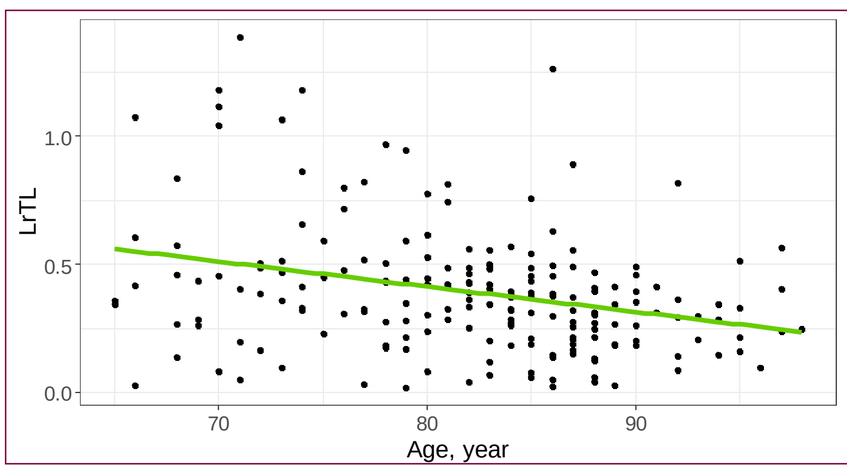


Fig. 2. Correlation between LrTL and age (r = –0.45, p<0.001)

CONCLUSIONS

Shorter telomeres correlate with older age as well as frailty and sarcopenia. Older adults with shorter telomeres have a 4.5 higher odds of sarcopenia and/or frailty. Our findings provide evidence for an additional determinant of sarcopenia and frailty. A deeper understanding of this association could inform interventions aimed at improving healthspan and quality of life in the aging populations.

ACKNOWLEDGMENTS

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