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Rationale: Sarcopenia is an age-related loss of muscle mass and strength associated with changes in skeletal muscle protein homeostasis due to lipid accumulation and anabolic resistance. These two latter phenomena are also observed in obesity which is known to be associated with overactivated endocannabinoid system. The aim of this study was to evaluate the disturbances of the endocannabinoid system in ageing and their putative link to skeletal muscle mass and function in old rats.

Methods: 6-month adult and 24-month old male rats were used to evaluate locomotor activity in openfield and voluntary gait by Catwalk tests. Weight of the hindlimb muscles was measured after sacrifice, and plasma concentrations of endocannabinoid (AEA, 2AG) and endocannaiboid-like metabolites (PEA and OEA) were measured by LCF-MS/MS. Comparison between groups were analyzed by student t-test and Pearson's correlation analysis was used.

Results: Compared to adult rats, old rats display higher fat mass (19±1 vs 14±1%, P<0.01) and lower lean mass (72±2 vs 80±2%, P<0.01), exemplified by a 49% decrease in hindlimb muscle mass (P<0.01), characteristics of sarcopenia. This loss of muscle mass was associated with reduced traveled distance (2720±550 vs 4804±960cm, P<0.01), mean speed (12.8±1.8 vs 10.1±0.8cm/sec, P<0.01) and duration of activity (268±49 vs 374±50sec, P<0.01) in openfield, and Catwalk analysis revealed that voluntary gait was severely impaired in old rats. Plasma levels of AEA, 2AG, PEA and OEA (pmol/ml) are described in the following table:

	AEA	2AG	PEA	OEA
Adult rats (n=11)	2.0±0.2	48.9±6.2	49.8±6.0	21.4±2.6
Old rats (n=8)	2.2±0.3	64.6±8.3 (P=0.07)	37.1±2.6*	12.9±1.1**

* P<0.05, ** P<0,01 vs adults.

Correlation analysis revealed that plasma levels of OEA, and to some extents PEA, were positively correlated with traveled distance (r^2=0.31,P<0.02), mean speed (r^2=0.20, P=0.06), duration of activity (r^2=0.27, P<0.03) and several parameters of voluntary gait (P<0.05).

Conclusion: These results demonstrate that plasma levels of endocannabinoids and endocannabinoid like metabolites are altered in sarcopenic old rats and that OEA plasma levels are associated with skeletal muscle dysfunction and loss of mobility with age.

Disclosure of Interest: None Declared

Keywords: endocannabinoids, sarcopenia