Sarcopenic obesity and insulin resistance: application of novel body composition models

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Sarcopenic Obesity (SO) is characterized by the co-occurrence of high adiposity (HA) and low muscle mass (LM)(1) and it has been linked to insulin resistance, inflammation and increased cardio-metabolic risk(2,3). This cross-sectional study investigated the association between markers of insulin sensitivity and SO defined using three novel body composition definitions: 1) body composition phenotypes; 2) truncal fat mass/appendicular skeletal mass ratio (TrFM/ASM) load-capacity; 3) fat mass/fat free mass ratio (FM/FFM) load-capacity(4,5).

314 participants (18–65 years) were included. Body composition was assessed by dual-energy-X-ray absorptiometry and stratified into four body composition phenotypes: Low Adiposity- High Muscle mass (LA-HM), High Adiposity- High Muscle mass (HA-HM), Low Adiposity- Low Muscle mass (LA-LM) and High Adiposity- Low Muscle mass (HA-LM). Subjects were also stratified into three centile groups: <15th, 15th-84th and ≥85th centile groups for TrFM/ASM and FM/FFM load capacity definitions(4,5).

Glucose tolerance was assessed using a 2-hour oral glucose tolerance test (OGTT) and insulin sensitivity was calculated using the Matsuda Index(6).

Lower insulin sensitivity was observed in the HA-LM (p < 0·001), as well as in the ≥85th centile groups of the TrFM/ASM ratio (p < 0·001) and the FM/FFM ratio (p = 0·001). HA-LM and ≥85th centile group of the TrFM/ASM ratio showed significantly higher (p < 0·001) HbA1c concentrations compared to the other phenotypes.

SO defined by both four body composition phenotypes and TrFM/ASM definitions showed a good association and a better prediction of insulin resistance.