Age-related difference of longitudinal associations of early/late cardiac systolic load with decline of preserved cardiac systolic function in Japanese men

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Funding Acknowledgement: Type of funding source: Private company. Main funding source(s): Omron Health Care, Asahi Calpis Wellness

This prospective observational study was conducted to examine the longitudinal associations of early/late cardiac systolic load (ESL/LSL) with decline of preserved cardiac systolic function, and also to examine the age-related differences in their associations. In 3679 middle-aged Japanese healthy men (43±9 years), brachial-ankle pulse wave velocity (baPWV) which related to ESL, radial augmentation index (rAI) which related to LSL and pre-ejection period/ejection time (PEP/ET) were measured annually during a 9-year study period. In subjects aged <50 years old (n=2586), baPWV, rAI and PEP/ET were annually increased. The PEP/ET at both the start and end of study period were significantly increased from low to high tertile ranges of baPWV and also of rAI at the start of study period (Figure). In subjects aged >50 years old (n=1093), baPWV and PEP/ET, but not rAI, were annually increased. Then, the PEP/ET at both the start and end of study period were increased among the tertile ranges of baPWV but not in those of rAI (Figure). In the mixed model linear regression analysis, while the baPWV (estimate = 7.2×10^{-5}, $p<0.01$) and rAI (estimate = 60.0×10^{-5}, $p<0.01$) were longitudinally associated with the PEP/ET in subjects under 50 years of age, only baPWV had a significant longitudinal association with PEP/ET (estimate = 8.4×10^{-5}, $p<0.01$) in subjects aged >50 years old. Thus, in Japanese healthy men, age-related differences in the progression of vascular functional abnormalities may result in a difference in their effect on the decline of preserved cardiac systolic function. Namely, while age-related increase in ESL related with arterial stiffness may decrease preserved cardiac systolic function in subjects of all ages, age-related increase in LSL related with pressure wave reflection may decrease this parameter only in subjects under 50 years of age.

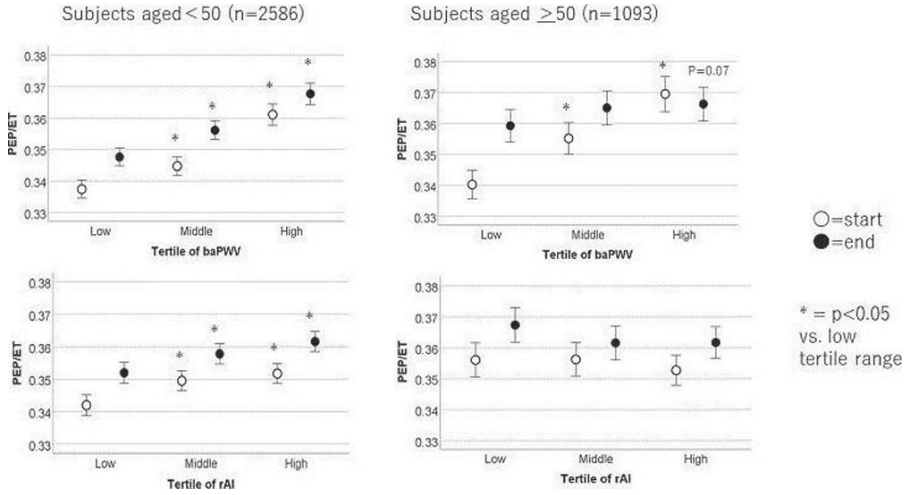

Figure 1