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Immuno-hematologic function (IHF) is increasingly being recognized as a central component of health status in older age. In this study, we sought to identify homogeneous IHF profiles regarding their relationship to all-cause mortality. We then studied the distribution of these profiles among individuals over age 65. We used data on 30,828 NHANES participants, including 10 baseline complete blood count with differential components [e.g., lymphocytes, leukocytes, red cell distribution width (RDW)] and all-cause mortality. We used latent profile analysis (LPA) to simultaneously optimize intra-cluster homogeneity on CBC components and inter-cluster survival differences. LPA (using MPlus 8.2) allowed for the empirical comparison of different solutions based on goodness-of-fit criteria. After LPA model convergence, a 9-class solution balanced goodness-of-fit criteria and interpretability of the resulting classes. The largest 3 classes accounted for 83.7% of the sample, with classes 1, 2 and 3 comprising 32.1%, 28.6% and 23.6%. Class 2 had lower lymphocytes, monocytes, neutrophils and platelets relative to classes 1 and 3. Survival rates were different between classes 1 and 2 (Cox model hazard ratio, HR=0.85; P=0.012) and 2 vs 3 (HR=1.18; P=0.001). The remaining 6 classes, which generally shared in common characteristics of higher RDW and lower hemoglobin, also were involved with significant survival differences. Multinomial logistic regression revealed that, among the subset of 7,173 participants over 65, older age was significantly associated with membership in class 1 relative to classes 2 (P<0.001) and 3 (P<0.001). These results point toward the possibility of developing immune marker profile indicative of accelerated aging.

EARLY TIME RESTRICTED FEEDING IMPROVES HIGH DENSITY LIPOPROTEIN FUNCTION IN GERIATRIC MONKEYS

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Ageing conveys the greatest risk for cardiovascular disease (CVD) development, which is the dominant cause of mortality in developed nations. High density lipoprotein (HDL) particles mediate reverse cholesterol transport, are anti-inflammatory and their function predicts CVD. We observed lower plasma cholesterol efflux capacity in geriatric vervet monkeys (p=0.03) when consuming either healthy or Western diets. Adult (n=16) and geriatric (n=19) monkeys were stratified into groups fed Western diet on ad libitum (Ad Lib) or early time restricted feeding (eTRF) schedules. eTRF supplied excess food only between 6am to 2pm. Housing, seasonality and fasting conditions for data and sample collections were equivalent. After 6 months, cholesterol efflux to HDL was greater in eTRF monkeys (p=0.01), with no age by group interaction. Efflux media and plasma was chromatographically separated to confirm labelled cholesterol, and enzymatically measured cholesterol, respectively, was affiliated with HDL particles. eTRF monkeys had higher total plasma cholesterol levels (p=0.03) which was due to greater cholesterol amounts associated with only HDL, and resulted

in HDL particles that were larger. eTRF resulted in robustly better HDL function such that measures from geriatric individuals were comparable to younger adults. Additionally, no differences in adiposity was observed in eTRF monkeys. Few interventions are known to raise HDL levels, and more importantly, are confirmed to improve HDL function. Our study is to date the largest, longest, controlled eTRF evaluation in primates and we show that positive biological effects are observable in HDL isolated from both adult and geriatric individuals independently of weight change.

DEVELOPING THE COMMON MARMOSET AS A TRANSLATIONAL MODEL OF AGE-RELATED OSTEOARTHRITIS

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Age is a primary risk factor for osteoarthritis (OA). The mechanisms that contribute to OA are poorly understood and disease modifying treatments have not been identified. A critical shortcoming in developing therapies is the limited number of translational models available to identify the causes of naturally occurring OA. Our goal is to use the common marmoset as a non-human primate (NHP) model of age-related OA. NHP are the closest evolutionary relative to humans and share many characteristics of human aging. The marmoset has advantages over other NHP for aging research because of their relatively short maximal lifespan and small size. Micro-computed tomography (uCT) was performed on whole-knee joints obtained from young (10 yrs, n=3) marmosets at necropsy. OA was evaluated using a clinical uCT scoring system and quantitative assessments of subchondral bone structure and ossified meniscal volume. Advancing age was positively correlated to increased uCT OA score (p<0.05, r=0.59), mainly through increased number and size of osteophytes and progressive subchondral bone sclerosis from the medial to both medial and lateral compartments. For marmosets displaying meniscal ossification, older marmosets had greater (p<0.05) ossified meniscal volume than middle-aged and younger marmosets, respectively. Trabecular (p=0.05) and cortical bone thickness (p<0.05) were also lower in older marmosets. These data are the first to indicate that the marmoset develops naturally occurring, age-related OA and support the pursuit of additional studies using the marmoset to identify OA mechanisms and test potential interventions.

LIFETIME EXERCISE ATTENUATES AGE- AND WESTERN DIET-RELATED DECLINES IN PHYSICAL FUNCTION IN MICE

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Ageing is associated with progressive declines in physical function. However, it is unknown if consumption of a western-style diet (WD; high-fat and sucrose, low fiber),