THE INFLUENCE OF TIME-RESTRICTED FEEDING ON MESENTERIC ARTERIAL FUNCTION IN OLDER OBESE MICE

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Endothelial dysfunction resulting from systemic inflammation and/or metabolic disruption precipitates age and obesity-associated vascular complications. Time-restricted feeding (TRF) prevents metabolic diseases in mice fed an obesogenic diet, but its effect on endothelial function in the context of obesity and/or aging is unknown. Here we tested the hypothesis that TRF attenuates age and obesity-induced vascular dysfunction. Three-month old C57BL/6J male mice consumed high-fat high sucrose (HFHS) chow ad-libitum for 10-months. At 13-months of age, one group of mice continued HFHS feeding in an ad-libitum manner (ALF), whereas another group consumed HFHS chow between 0800-1700 only (i.e., TRF). Importantly, all mice were familiarized with and maintained on an altered light: dark cycle such that the dark phase occurred between 0800 and 1700. After 12-months of HFHS feeding, vasomotion was assessed in mesenteric arteries from 25-month-old ALF (106±4 um i.d.) and TRF (105±4 i.d.) mice (n=8 mice per group) using isometric tension procedures. Non-receptor mediated vasocontraction to potassium chloride (10-100 mM) was similar between groups. α-1 receptor-mediated vasocontraction to phenylephrine (PE; 10^{-8} – 10^{-5} M) was similar between groups. After precontraction with phenylephrine (PE) to ~ 70% of maximal PE-induced tension development, vasorelaxation to acetylcholine (ACh; 10^{-8} – 10^{-5} M) was greater (p<0.05) in TRF vs. ALF mice, whereas responses to sodium nitroprusside (SNP; 10^{-9} – 10^{-4} M) were similar between groups. These preliminary findings indicate TRF preserves mesenteric artery endothelial function in obese, aged mice. TRF might be an efficacious lifestyle modification strategy to lessen obesity-associated disruptions to vascular health in the context of aging.