with wild type (WT) mice, AT-EOS numbers were markedly increased in multiple fat depots from hEo2Tg mice, including subcutaneous white adipose tissue (sWAT). After 12 weeks of high-fat diet (HFD), hEo2Tg mice showed significantly less body weight gain and fat mass compared with WT littermates. These changes were associated with an improvement in glucose tolerance. We also found increased oxygen consumption and heat production in hEo2Tg mice under room temperature conditions. The increased thermogenesis was accompanied with an increased expression of browning genes such as Ucp1, Prdm16, Dio2 in sWAT from hEo2Tg HFD mice. So far, our data suggest that AT-resident EOS promote browning of sWAT. This, in turn, protects our animals against development of HFD-induced obesity and insulin resistance. Next, whole transcriptome mRNA sequencing and bioinformatic analyses were performed and showed a significant increase of myogenic differentiation 1 (Myod1) gene expression in hEo2Tg sWAT mice. This was confirmed by qRT-PCR. Myod1 is a key regulator of skeletal muscle differentiation. Given the shared features between brown fat and skeletal muscle, we speculate that by increasing Myod1 gene expression, (AT)-resident EOS mediate sWAT browning. Additional studies are needed to determine the molecular mechanism(s) underling the regulation of Myod1 gene expression by AT-resident EOS and its effect on sWAT browning.

Reproductive Endocrinology

MALE REPRODUCTIVE HEALTH THROUGHOUT THE LIFESPAN

Effect of Testosterone Replacement Therapy Added to Intensive Lifestyle Intervention on Cognitive Functions in Frail, Older Veterans with Hypogonadism and Obesity: A Randomized Clinical Trial

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Background: Both hypogonadism and obesity are common in older men which might additively exacerbate their age-related decline in cognitive functions. We tested the hypothesis that the addition of testosterone replacement therapy to intensive lifestyle intervention would enhance the benefits of intensive lifestyle intervention on cognition in older men with hypogonadism and obesity.

Methods: Eighty-three older (age≥65 years) male veterans with obesity (BMI≥30 kg/m^2) and evidence of persistently low AM testosterone (<300 ng/dl) associated with frailty (modified Physical Performance Test score <31) were randomized to six months of: 1) lifestyle therapy (diet-induced weight loss and supervised aerobic and resistance exercise training) + testosterone replacement therapy (LT+Test) or 2) lifestyle therapy + placebo (LT+Pbo). In this secondary analyses, outcomes were changes in cognition as assessed through comprehensive cognitive test battery (Modified Mini-Mental State Exam, Word Fluency Test, Trail Making Test Parts A and B Rey Auditory Verbal Learning Test, Stroop Color and Word Test, and Symbol Digit Modalities Test). We used z scores of changes in the cognitive tests to assess changes in attention, memory, executive function, language, global, and composite cognitive functions in response to the lifestyle and hormonal interventions.

Results: After 6 months, body weight decreased similarly in the LT+Test group and LT+Pbo group (decrease of 9.7 kg vs. 10.3 kg, respectively; P=0.91) whereas testosterone levels increased more in the LT+Test than in the LT+Pbo group (increase of 324 ng/dl vs 88 ng/dl, respectively; P<0.001). Memory z-score increased more in the LT+Test group than in the LT+Pbo group (0.73 vs. 0.39, respectively; P=0.03). Moreover, attention z-score increased more in the LT+Test group than in the LT+Pbo group (0.89 vs. 0.38, respectively; P=0.01). On the other hand, changes in executive function z-score, language z-score, and global z-score did not significantly differ between the LT+Test group and LT+Pbo group (0.45 vs 0.37, 0.34 vs 0.07, and 0.55 vs 0.29, respectively; P=0.13 to 0.56). More importantly, the composite cognitive z-score obtained by averaging all z-scores from each domain increased more in the LT+Test group than in the LT+Pbo group (0.56 vs 0.27; P=0.003).

Conclusion: These findings suggest that in the specific population of older men with hypogonadism and obesity associated with frailty, testosterone replacement therapy can augment the positive effects on cognition from intensive lifestyle intervention by diet-induced weight loss and combined aerobic and resistance exercise.

Thyroid

BENIGN THYROID DISEASE AND HEALTH DISPARITIES IN THYROID II

Utilizing Patient Online Forums to Capture Experiences and Perceptions Associated with the Use of Desiccated Thyroid Extract

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Background: It is estimated that 10-25% of patients with hypothyroidism use desiccated thyroid extract (DTE) as their primary thyroid hormone replacement medication, despite concerns about the risk of thyrotoxicosis associated with DTE use. It is unclear why many patients prefer the use of DTE as a thyroid hormone replacement formulation