SAT-583

Pituitary Adenylate Cyclase Activating Polypeptide (PACAP) is a peptide hormone known to regulate energy homeostasis[1]. Mice lacking PACAP are cold sensitive and have impaired adrenergic-induced thermogenesis[2-4]. Interestingly, *Pacap* null mice can survive cold housing if acclimated slowly, similar to what was observed in UCP1 deficient mice[4,5]. We hypothesized that *Pacap*-/- mice employ alternate thermogenic pathways to compensate for impaired adaptive thermogenesis and assessed shivering thermogenesis and UCP1-dependent and UCP1-independent adaptive thermogenesis in male and female *Pacap*-/- and *Pacap*+/+ with cold acclimation (4°C). Assessment of oxidative fibres in skeletal muscles and behavioural observations did not show evidence of prolonged shivering in male or female *Pacap*-/- mice during cold acclimation compared to *Pacap*+/+ mice. We did however observe morphological and molecular differences in adipose tissues of *Pacap*-/- mice compared to *Pacap*+/+ mice that were distinct in males and females. Cold-acclimated, female *Pacap*-/- mice had decreased induction of UCP1 protein in intrascapular brown fat (iBAT), yet had a significantly higher beiging and UCP1 immunoreactivity (ir) in gonadal white fat (gWAT) compared to female *Pacap*+/+ mice. Furthermore, beiging was observed in inguinal white fat (ingWAT) and gWAT of female *Pacap*-/- mice housed at thermoneutrality (30°C), a finding not observed in *Pacap*+/+ control mice. Unlike female mice, we did not observe impaired UCP1 induction in iBAT of male *Pacap*-/- mice compared to *Pacap*+/+ mice, and this was associated with negligible UCP1-ir in male gWAT similar to wildtype controls. Despite previous work that has established impaired adaptive thermogenesis in *Pacap*-/- mice[4], we show here that UCP1 protein can be induced in adipose tissues of *Pacap*-/- mice during cold acclimation, although to a lesser degree or in a different pattern compared to *Pacap*+/+ control mice. Taken together, this work suggests that while PACAP is clearly involved in regulating thermoregulation, it is not required for cold-induced UCP1 expression. In addition, this work highlights sexual dimorphism in adipose tissue remodeling and induction of thermogenesis with cold acclimation. References: (1) Rudecki AP, et al. Trends Endocrinol Metab. 2016;27(9), 620–632. (2) Gray SL, et al. J Mol Endocrinol. 2001;15(10), 1739–1747. (3) Gray SL, et al. J Endocrinol. 2002;143(10), 3946–3954. (4) Diané A, et al. J Endocrinol. 2014;222, 327–339. (5) Golozoubova V, et al. FASEB J. 2001;15, 2048–2050.

Adrenal

ADRENAL - TUMORS

Relationship Between Visceral Fat and the Position of Adrenal Glands in Cranial-Caudal Direction in Patients with Primary Aldosteronism

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SAT-177

Context: Adrenal glands locate at the retroperitoneal space and could be affected their positions by some factors. Adrenal glands being surrounded by visceral adipose tissue (VAT), we have hypothesized that the VAT amount influences the position of adrenal glands in cranial-caudal direction. In patients with primary aldosteronism (PA), comprehending the position of adrenal glands in cranial-caudal direction might be useful to predict the position of adrenal veins before performing adrenal venous sampling.
Objectives: To clarify the influence of VAT amount on the position of adrenal glands, we investigated the correlation of visceral fat parameters with the position difference of adrenal glands in cranial-caudal direction in patients with PA.
Materials and methods: This retrospective observational study included patients with PA according to the guidelines of both the Japan Endocrine Society and the Japan Society of Hypertension. Those with adrenal tumors more than 10 mm in diameter in computed tomography (CT) were excluded. We measured the position difference of the adrenal glands in cranial-caudal direction, from the top of right adrenal gland to the top of left adrenal gland by CT. We correlated visceral fat percentage (VF%), visceral fat area (VFA), and subcutaneous fat area (SCFA) evaluated by CT studies with the position difference of adrenal glands in cranial-caudal direction.
Results: We analyzed 150 patients [male (n = 50), female (n = 100)]. Patients' characteristics: Age was 54.8 ± 11.4, body mass index 24.9 ± 3.8 kg/m^2, plasma aldosterone concentration 133.5 [101–176] pg/ml, plasma renin activity 0.3 [0.2–0.5] ng/ml/h, VF% 25.8 [19.8–33.6] %, VFA 88.3 [60.9–125.0] cm^2, and SCFA was 147.4 [105.6–193.4] cm^2 (mean ± SD, or median [interquartile range]). The position difference of adrenal glands in cranial-caudal direction was 9.7 ± 10.0 mm. In 120 patients (80.0%), left adrenal glands locate at the upper position comparing to right adrenal glands. In 19 patients (12.7%), right adrenal glands were positioned at the upper comparing to left adrenal glands. A positive correlation of VF%, VFA with the position difference of adrenal glands in cranial-caudal direction were shown (r = 0.451, p < 0.001, r = 0.426, p < 0.001, respectively). No significant correlation of SCFA with the position difference of adrenal glands in cranial-caudal direction was shown (r = 0.122, p = 0.139). In patients with more VAT amount, right adrenal glands locate at the upper position comparing to left adrenal glands. In patients with less VAT amount, left adrenal glands locate at the upper position comparing to right adrenal glands.
Conclusions: Regardless of the variation of the position of adrenal gland on each side, the correlation was found between VAT and the position difference of adrenal glands in cranial-caudal direction in PA.

Neuroendocrinology and Pituitary

PITUITARY TUMORS: TRIALS AND STUDIES

Results From the Phase 3, Randomized, Double-Blind, Placebo-Controlled CHIASMA OPTIMAL Study of Oral Octreotide Capsules in Adult Patients with Acromegaly

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