ultrastructure injury in the ApoE-deficient mice in association with enhanced ACE2 levels and suppression of the TGF-β1/Smad/ERK and MMP signaling. Apelin would represent a highly effective strategy for blood pressure control, vascular injury, and remodeling management.

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GW25-e2275
Mitochondrial tRNA-Thr Gene Mutation in Maternally Inherited Hypertension and the Regulatory Mechanism in Adiponectin Pathway
Lan yunfeng1,2, Yin Tong1, Zha Qinglei1, Yang Jie2, Li Zongbin2, Liu Yiqi2, Chen Wei1, Zhenxun Li1
1Department of Healthcare, Hainan Branch of Chinese PLA General Hospital, 2Cardiovascular Department of Chinese PLA General Hospital

Objectives: The offspring hypertension and mother hypertension has a significant correlation, and also the mutations are related with elevated blood pressure, but the underlying mechanism is unclear. Based on a study with small sample size and two pedigrees maternal family members, we tried to reveal the related mechanisms how EH characterized with maternal inheritance is caused by mitochondrial mutations.

Methods: Totally 115 pedigrees were enrolled in this study. The subjects answered questionnaires and received full mitochondrial genome sequencing analyzing. According to the incidence of hypertension in three-generations of Chinese family, they were divided into maternally-inherited EH pedigrees (group A, n=17), non-maternally-inherited EH pedigrees (group B, n=85), and normal control pedigrees (group C, n=33). In order to clarify the relationship between mtDNA C15910T and maternally inherited EH, all maternal family members’ whole mitochondrial genome carrying mtDNA C15910T mutation from Zhaozhou and Inner Mongolia pedigrees were collected, and analyzed both biochemically and genetic. To further reveal the mechanism through which mtDNA C15910T causes maternally inherited EH, peripheral blood mononuclear cells (PBMCs) from Zhaozhou pedigrees were cultured in vitro. They are divided into four groups, hypertension matrilineal (n=6, EH+Mu), non-hypertension matrilineal (n=6, Mu), hypertension without mutation (n=6, EH), and normal controls (n=6, con).

Results: The results indicated that mitochondrial tRNA gene mutation was significantly correlated with EH. Mitochondrial tRNA gene mutation occurred more frequently in patients with EH. We found that the overall incidence rate of EH was 59.3% in Zhaozhou and Inner Mongolia pedigrees and 90% in males, significantly higher than in the general population in China (33.5%); the age at onset of EH in members carrying mtDNA C15910T is earlier than in gender- and age-matched groups. The mtDNA C15910T, which is extraordinarily conserved from mollusc to human mitochondria, is located at D-loop of tRNA Thr. The serum sodium and chloride levels were increased in members carrying mtDNA C15910T, while more significantly in maternally accompanied by EH. In vitro, we found that PBMCs carrying mtDNA C15910T were characterized by more viability and proliferation. The increased ATP production results in raised intracellular ROS. The mitochondrial dysfunction results in reduced APN levels secreted from adipose tissue, causing hypoadiponectinemia. Hypoadiponectinemia further promotes cell proliferation, which in turn produces more ROS. This vicious cycle promotes the occurrence of EH with maternal inheritance. The mRNA of mtDNA C15910T. The APN, AdipoR1, PGC-1α and ERRα were reduced, but ERRγ was significantly upregulated in C15910T mutation group.

Conclusions: It is suggested that mtDNA C15910T induced maternally inherited EH, either directly, or by elevating serum sodium and chloride levels. APN pathways may play important roles in the pathogenesis of EH. It indicated that the mtDNA C15910T mutation may induce hypertension by changing APN, AdipoR1, PGC-1α and ERRα signal pathway to elevate blood pressure.

GW25-e2319
Effects and mechanisms of Angiotensin (1-7) on the expression of growth factors in macrophage foam cells
Wu Tao Zeng1, Xiang Wang1, Weiyan Chen1, Xiuting Sun1, Meiling Liang1, Zhenxun Li1
1Division of cardiology, Cardiovascular Medical Department, the First Affiliated Hospital of Sun Yat-sen University, Guangzhou, China, 2Department of Intensive Care Unit, the Second Affiliated Hospital of Guangzhou Medical University, Guangzhou, China

Objectives: To explore if Angiotensin (1-7) can modulate the content of cholesterol and the expression of ATP-binding cassette transporter A1 (ABCA1) in macrophage foam cells.

Methods: THP-1 cells were induced into macrophages by 130ng/mL phorbol myristate acetate (PMA) for 48h. The THP-1-derived macrophages were co-cultured with Gao Jinliao2, Wang Xueping2, Zhu Chao2, Zhao Xiaojing2, Li Yang2

GW25-e2323
Effects and mechanisms of Angiotensin (1-7) on the expression of cytokines in macrophage foam cells
Lan yunfeng1,2, Yin Tong1, Zha Qinglei1, Yang Jie2, Li Zongbin2, Liu Yiqi2, Chen Wei1, Zhenxun Li1
1Division of cardiology, Cardiovascular Medical Department, the First Affiliated Hospital of Sun Yat-sen University, Guangzhou, China, 2Department of Intensive Care Unit, the Second Affiliated Hospital of Guangzhou Medical University, Guangzhou, China

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GW25-e2509
Hyperglycemia and oxidative stress stimulate abnormal proliferation of atrial fibroblast through NADPH oxidase/MAPK/MPMP signal pathway
Liu Tong, Zhang Qiong, Wang Xinghui, Liang Xue, Li Guangming
Division of Cardiology, Second Hospital of Tianjin Medical University

Objectives: Atrial fibrosis is one of the fundamental pathophysiological mechanisms in the development of atrial fibrillation, and the abnormal proliferation and polarization of atrial fibroblast stimulated by high levels of pathological factors participate in this process. Several epidemiological studies have indicated that diabetes mellitus is an independent risk factor of the onset and perpetuation of atrial fibrillation. Previous studies found that oxidative stress is a significant trigger of the abnormal proliferation and polarization of atrial fibroblast by up-regulation of the activity of nicotinamide adenine dinucleotide phosphate-oxidase (NADPH oxidase) and mitogen-activated protein kinases (MAPK) signaling transduction. However, the variation of atrial fibroblast in hyperglycemic and oxidative stress state needs more exploration.

Methods: Atrial fibroblast isolated from adult rabbits’ left atrium is cultured and stimulated respectively by high levels of glucose, hydrogen peroxide (H2O2) and their combination and the NADPH oxidase inhibitor apocynin. We test the variation of proliferation of the fibroblast by MTS colorimetric method and the alteration of protein expressions of NADPH oxidase, MAPK signal pathway and matrix metalloproteinases 9 (MMP9).

Results: High levels of glucose and H2O2 promote the proliferation of atrial fibroblast and H2O2/H2O2 have the similar ability of acceleration compared with hyperglycemia. However, the combined stimulus of hyperglycemia and H2O2 reveals even more remarkable enhancement of proliferation of fibroblast (P<0.01). And all the promotion by these agents can be depressed by apocynin (P<0.01). The expression of Rac1, the regulatory subunit of NADPH oxidase is up-regulated by activation of high concentration of glucose, H2O2 and the combined stimulus (P<0.01). And this