Editorial

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Journal of Heart and Cardiovascular Research

2017
Vol.1 No.1:e102

Current Trends in Heart and Cardiovascular Research

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Received date: March 05, 2017; **Accepted date:** March 08, 2017; **Published date:** March 15, 2017

Citation: Ibraimov A, Kar SK, Das R (2017) Current Trends in Heart and Cardiovascular Research. J Heart Cardiovasc Res. Vol. 1 No. 1: e102.

Introduction

The heart is the most crucial part in the organ system of animals, which is responsible for pumping of blood. Such pumping work not only helps in circulation of blood throughout the body, but also helps to reach essential nutrients into cells and also assists in the removal of excretory substances from body. It is the only organ of our body, which never takes rest and such continuous function is controlled by in-voluntary muscles with specialized energy metabolism. Manipulation of impaired heart function for better performances has become successful due to rigorous studies and research. Though, in present scenario cardiovascular anomalies are the most prevalent issues for global mortality. Hence, spreading of cardiac health awareness among common people is the much needed goal of modern medical science. In such rationale, present Journal of Heart and Cardiovascular Research' is also contributing towards cardiac health consciousness, through accumulating relevant information on heart and cardiological perspectives.

The Journal of Heart and Cardiovascular Research aims at exploring all aspects of cardiovascular research such as cardiovascular physiology, disease, development etc. The current issue of the Journal of Heart and Cardiovascular Research presents some interesting findings in areas of cardiac currents, cardiovascular risk factors, and diagnosis of cardiovascular disease. Xu et al. [1], upon investigating the effect of extracellular adenosine (ado) on the cAMP-dependent chloride current ($I_{Cl.PKA}$ or I_{Cl}) observed that, similar to its effects on 'If' (hyperpolarization activated inward pacemaker current) and 'ICa' (L type Ca^{2+} current), ado attenuates ICl. Bernard et al. [2], observed that the waist circumference is the only obesity related trait significantly associated with pulse pressure (PP). Abdelnaby et al. [3], proposed the use of transthoracic echocardiography (TTE) and cardiac magnetic resonance imaging (CMR) for the timely diagnosis of Left ventricular (LV) pseudoaneurysm.

Six types of functional sarcolemmal chloride currents are present in the cardiac cells including chloride currents regulated by: (1) adenylyl cyclase- cyclic adenosine 5'-monophosphate (cAMP)- protein kinase A (PKA) pathway (I Cl.PKA), (2) purinergic receptors (I Cl.ATP), (3) protein kinase C (PKC) (I Cl.PKC), (4) cytoplasmic Ca^{2+}(I Cl.Ca), (5) cell volume (I Cl.vol), and (6) a basally active Cl– current ($I_{Cl.b}$). The cAMP-regulated Chloride channels are encoded by the cystic fibrosis gene in the heart, where they are involved in regulating the resting membrane potential, and the duration of action potential. Catecholamines, stimulate adenylyl cyclase and increase the intracellular cAMP levels, thereby activating cAMP-regulated Cl-channels. Further, catecholamines bring about increase in 'If' (hyperpolarization activated inward pacemaker current) and 'ICa' (L type Ca^{2+} current). This process is attenuated by extracellular adenosine (Ado) through its inhibition of adenylyl cyclase, and its action on A1Ado receptor (A1AdoR) mediated by a GTP binding protein (Gi) sensitive to pertussis toxin (PTX). Xu et al. [1], investigated the possibility of adenosine attenuating cAMP-dependent chloride current ($I_{Cl.PKA}$ or I_{Cl}). The authors observed that ado affects ICl in a manner similar to If and ICa.

A strong positive correlation exists between hypertension and obesity; with increasing age, weight gain is one of the primary determinants of blood pressure. The diagnosis of Hypertension is based on the systolic and diastolic blood pressure (SBP and DBP) values. None of the current recommendations suggest using pulse pressure (PP), for monitoring high blood pressure. But of late, there has been a significant increase in the recognition of PP as a crucial predictor of increased cardiovascular morbidity and mortality. Further, epidemiologic and clinical studies have demonstrated the tight correlation between increased PP and target organ damage. PP has been recognized as a crucial predictor of atrial fibrillation, heart failure, and the onset and recurrence of cardiovascular conditions. Therefore, PP is a better predictor of cardiovascular risk than the other parameters of blood pressure. Bernard et al. [2], investigated whether the relationship between PP and obesity is dependent on (1) gender, (2) age, (3) sedentary lifestyle, and (4) hypertension. The authors observed that, the waist circumference exhibited a correlation with PP only in individuals with (1) hypertension, (2) sedentary lifestyle, and (3) age less than 55 years. Gender

had no effect on the relation between the PP and obesity. Whereas, obesity related parameters such as BMI and waist: hip ratios were not correlated with PP. The authors found that, the waist circumference is the only obesity related parameter significantly associated with pulse pressure (PP).

Left ventricular (LV) pseudoaneurysm is a severe complication of acute myocardial infarction (MI), which is reported in less than 0.1% of MI patients. Unlike a true aneurysm involving the full myocardial wall thickness, LV results from contained myocardial rupture. Diagnosis of LV is a challenge. Due its fatal nature, urgent surgical intervention is a necessity for the management of this pathology. Abdelnaby et al. [3], present the case report of a 57-year-old male who had complained of exertional chest pain for the past six months. In addition, the patient also had an attack of acute retrosternal chest pain that had lasted for several hours. The patient was diagnosed with LV using transthoracic echocardiography (TTE) and cardiac magnetic resonance imaging (CMR), but died before surgery. The authors therefore propose the use of TTE and CMR for the timely diagnosis of LV.

References

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