Human Lives Can be Saved Using Novel Multifunctional Platform - an Active Hydraulic Ventricular Attaching Support System (ASD) by Xiaohui Zhou from Oasis Publishers

New York, NY, February 14, 2019 --(PR.com)-- Research paper published by Xiaohui Zhou entitled “Cardiac support device (ASD) delivers bone marrow stem cells repetitively to epicardium has promising curative effects in advanced heart failure.” Zhou’s work is directly related to heart failure (HF), “a common and multifaceted disease condition in the cardiovascular system (CVS), a disease which leads to various complex symptoms and ultimate death.”

According to the Centre for Disease Control and Prevention (CDC), heart failure happens when the heart cannot pump enough blood and oxygen to support other organs in the body. Heart failure is a severe condition, but it does not mean that the heart has stopped beating. It’s a condition which is characterized by structural or functional cardiac abnormalities. This condition eventually causes the impaired filling of the ventricles that results in the creation of an imbalance demand of energy between the heart and body and several other complications.

Zhou and co-workers observed that clinical research had advanced concerning diagnosis, prevention, and management of heart failure, but remained elusive as heart failure was the primary cause of death in developed countries. The team of researchers further quoted data, which shows that 20 million deaths happened due to heart failure and the occurrence is estimated to increase due to the aging population. Zhou’s inspiration on this subject area stemmed after studying this medical condition in depth.

Zhou analysed various interventional therapies such as percutaneous coronary intervention (PCI), ventricle reconstruction therapy such as Cardiac Support Device (CSD), which were developed for the management of heart failure. However, no attention was paid to the epicardium role in managing heart failure. So Zhou invented one novel multifunctional platform with the function of both diagnosis and management-active hydraulic ventricular attaching support system (ASD) - to manage heart failure. According to Zhou’s work, the ASD device is made up of highly biocompatible material (silicon) and consists of the hollow tubes with intercommunication of each other (detailed shape design could be found in the research papers of Zhou’s). The ASD could directly shape the heart and help the heart to pump blood through force derived from the fluid in the tubes of ASD which transfer the energy onto the core from connected power system outside the thoracic cavity.

Meanwhile, some apertures at the internal surface of tubes can generate communications of materials or signals between the heart and ASD. The ASD can also be connected to one or more administrating systems outside the body. Thus, by ASD, including drug/biological stem cells could directly flow outside of ASD tubules onto the epicardium to produce direct biological affection on cardiomyocytes or other heart tissues with a little dosage of drugs into blood circulation. Besides, many signals such as electromagnetic signals could also be transferred if there are relative sensors could be put onto the surface of internal apertures on the ASD device.

Zhou further stressed on ASD as a non-heart-transplant surgical option for the management of heart
failure. The ASD could have affected as one adjustable and measurable ventricular restraint device (VRD) to shape the heart. However, according to Zhou and co-workers, the transplantation of bone marrow stem cells and ASD is worthy to obtain better therapeutic outcomes. In their work, under the comprehensive treatment platform of ASD, they also demonstrated that the peculiar characteristics ASD displayed promising therapeutic outcomes to relieve heart failure symptoms, which is much more beneficial than only restraint therapy.

The team’s experiment results showed that heart failure was induced by left anterior descending (LAD) coronary artery ligation in all groups except the control group. It was seen that post-infarcted electrocardiography (ECG) and brain natriuretic peptide (BNP) exhibited an abnormal heart function. This was revealed in all model groups, and the HF + ASD-BMSCs group showed a remarkable improvement compared to other heart failures, HF + ASD groups on day 30.

The extensive investigation demonstrated that ASD had outstanding benefits: the drug delivery by ASD could achieve more long-term, more accurate and more effective results in the treatment of heart failure than single therapeutic platforms. Furthermore, Zhou and co-workers are trying to perform real-time heart monitoring, dynamic and biochemical physiology of cardiac function by attaching the micro-senor to the surface of the ASD. In totally, Zhou’s team are committed to building a precise multifunctional unified treatment platform. The ASD device was found feasible to the operation, and it improved the cardiac performance with improvement on the structure and function of the myocardium, it was observed that severity of heart failure could be significantly relieved without the finding of dysfunction of the other organs such as renal until now. Finding and assessing Zhou’s work is highly recommended to understand the significance of his jobs.

In conclusion, Zhou and co-workers proved for the first time a combination of VRD together with planting stem cells approach resulted in a great promise for the treatment of heart failure. Zhou suggests that the future efforts should be focused on equipping ASD with different micro-biosensors to get more signals directly from the heart to make ASD more potent on both effective diagnosis and helpful treatment of heart failure.

Zhou’s work has the scope of saving lives that fall prey to this condition. Early diagnosis and treatment by ASD could also improve the quality and life expectancy, so Zhou’s contribution to the field of advanced heart failure would be recognized by the medical practitioners.
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