

Heart failure treated 'in the brain'

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Beta-blockers heal the heart via the brain when administered during heart failure, according to a new study by UCL (University College London). Up to now, it was thought that beta-blockers work directly on the heart, but the new study shows that the drugs may also act via the brain, suggesting that future therapies to treat cardiovascular disease could be targeting the central nervous system.

Heart failure patients are routinely given beta-blockers, although doctors do not know exactly how these drugs boost cardiac performance and reduce the risk of death. The UCL study, based on the rat model of postmyocardial infarction-induced heart failure and published in the journal *Circulation Research*, has discovered that the beta-adrenoceptor blocker metoprolol acts directly in the brain to slow the progression of heart failure. The action seems to be localised to a group of brain cells that UCL researchers have identified previously as being crucial in the control of blood pressure and heart rate.

Professor Mike Spyer, UCL Vice-Provost and co-author of the study, says: “Our study shows the importance of the brain in regulating the cardiovascular system. This is often ignored by cardiologists who concentrate on the dynamics of cardiac contraction and the receptors on the heart that influence this, rather than how the nervous innervation of the heart is regulated.”

Millions of heart failure patients worldwide are routinely treated with beta-blockers, which were pioneered in the 1970s for the treatment of arterial hypertension and are one of the most important advances in heart

failure therapy. However, it has not entirely been clear how long-term treatment with beta-blockers slows the development of heart failure, improves heart function and exercise capacity and reduces the risk of sudden cardiac death.

Dr Alexander Gourine, UCL Department of Neuroscience, Physiology and Pharmacology, says: “Many people have assumed that beta-blockers have a direct salutary influence on the heart, but our findings challenge this view, suggesting that beta-blockers may act directly in the brain and this action could underlie their beneficial effect on the failing heart. This study suggests that novel ways might be found to treat cardiovascular disease aimed at sites within the brain.”

Source: University College London

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