Cardiac myotropes as a novel inotropic treatment for patients of heart failure with reduced ejection fraction

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Madam, heart failure with reduced ejection (HFrEF) fraction is a common affliction of heart failure patients. It is defined as an ejection fraction of less or equal to 35% caused by a decrease in systolic function.[1] Causes include coronary artery disease, myocardial infarction, congenital heart defects, high blood pressure and diabetes. Heart failure is a common condition in Pakistan estimated by some studies to have upto 2.8 million patients in the country.[2] As heart transplants are to date not performed in Pakistan, physicians rely on treatments such as mechanical circulatory assist devices including left ventricle assist devices, drugs such as inotropes, diuretics and beta blockers for patient's treatment. Among the medical treatments, a new class of inotropes, cardiac myotrope, omecamtive mecarbil is pending US FDA approval.

Omecamtiv mecarbil promotes increased interaction between myosin and actin, increasing the force, efficiency and duration of cardiac muscle contraction without affecting cytosolic calcium thereby having no negative outcomes such as arrhythmias or ischaemia.[3] Whereas traditional inotropic agents such as catecholamines, phosphodiesterase-3 inhibitors, sodium-potassium adenosine triphosphatase inhibitors have shown- through their calcium-based mechanisms- to have negative side effects such as arrhythmias, increased oxygen demand and mortality.[4] Long-term use of catecholamines and phosphodiesterase-3 inhibitors are associated with increased mortality in heart failure with reduced ejection fraction patients as seen in both observational cohort studies and randomized control trials.[3] Conventional inotropes are widely used in heart failure patients experiencing cardiogenic shock[3] thereby increasing the likelihood of long-term negative effects. The recent GALACTIC-HF double blind trial has shown omecamtiv mecarbil to improve cardiac function, ventricular wall stress and reverse ventricular remodeling without any negative effects on renal function, blood pressure or heart rate observed in current heart failure therapies.[1]

While continued research and drug development is needed, myotropes such as omecamtiv mecarbil seem to be a promising, less dangerous alternative to traditional inotropic treatments for HFrEF patients. Further drug development may produce even more effective drugs of the same class. More detailed analysis of the GALACTIC-HF trial as well as subsequent trials are still needed to cement the effectiveness and safety of myotropes. The large number of chronic heart failure patients in the country will need a safe, long term treatment for the foreseeable future, this need can easily be filled by current and future mytotropic drugs for improved heart function.

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