Changing Algorithms for the Management of Acutely Decompensated Congestive Heart Failure

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Nesiritide (a recombinant B-type natriuretic peptide) is the first new drug approved by the U.S. Food and Drug Administration (FDA) in 14 years for the treatment of acutely decompensated congestive heart failure (CHF). Endogenous B-type natriuretic peptide is a cardiac hormone produced by the failing heart to counteract the maladaptive hemodynamic, neural, and hormonal compensations associated with the syndrome of CHF. Nesiritide is identical to the naturally occurring peptide, and like this peptide, nesiritide causes preload and afterload reduction (leading to increases in cardiac index without reflex tachycardia or direct inotropic effect), increased diuresis and natriuresis, and suppression of the renin–angiotensin–aldosterone axis and sympathetic system.

In a large randomized controlled clinical trial of 489 patients (VMAC-**V**asodilation in the **M**anagement of **A**cute Decompensated **C**ongestive Heart Failure), nesiritide was found to be faster and more effective than IV nitroglycerin (NTG) plus standard care at improving hemodynamics and symptomatology in patients with acutely decompensated CHF who have dyspnea at rest. In this trial, significantly fewer patients in the nesiritide strata had any adverse event as well as the specific adverse events of headache and abdominal pain compared to those on IV NTG plus standard care. Rates of symptomatic hypotension were similarly low in both groups (4% nesiritide, 5% IV NTG plus standard care). In another randomized, controlled trial (PRECEDENT-**P**rospective, **R**andomized **E**valuation of **C**ardiac **E**ctopy with **D**obutamin**E** or **N**atrecor® **T**herapy) using holter monitoring for 24 hours prior to and for 24 hours during treatment with either dobutamine or nesiritide, dobutamine significantly increased myocardial ectopy, including occurrence of ventricular tachycardia in patients with or without prior history of that event. In contrast, nesiritide showed either no effect on baseline ectopy or a reduction in ectopy. Additionally, dobutamine significantly increased heart rate; however, nesiritide did not.

Because of its unique mechanism of action and greater safety compared to both standard inotropic

therapy (dobutamine) and vasodilator therapy (IV NTG plus standard care), the availability of nesiritide will alter the current algorithms for CHF management. Based on our experience with nesiritide to date, we propose the following new algorithm for the initial management of acutely decompensated CHF. Volume overloaded CHF patients with adequate systolic blood pressure (>90 mm Hg) should benefit from this new approach and may require fewer IV diuretics. ■

Initial Treatment Algorithm for Acutely Decompensated Heart Failure