**IS "CHRONOTROPIC INCOMPETENCE" AN ADAPTIVE MECHANISM IN SYSTOLIC HEART FAILURE?**

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Chronotropic Incompetence (CI) is thought to contribute to exercise intolerance in heart failure by reducing peak exercise cardiac output and oxygen consumption. We aimed to assess benefits of chronotropic support during exercise in patients with severe symptomatic left ventricular systolic dysfunction. Ten adults (mean age 55 years, 6 men) with advanced (NYHA class III-IV, peak VO2 less than 10 ml/kg/min) underwent continuous respiratory gas exchange monitoring, echo-Doppler cardiography and bicycle exercise with (paced exercise) and without (control exercise) right atrial pacing at 10 bpm above peak exercise heart rate (HR). Maximum HR achieved at symptom-limited exercise was 64 to 83% (74%). Control exercise resulted in significant increase in HR (121 versus 94 bpm, p less than 0.05), no change in forward stroke volume

(39 versus 41 ml, p=NS), and significant rise in cardiac output (4.7 versus 3.5 L/min, p less than 0.05). Mitral regurgitation volume and fraction remained unchanged. At a mean HR of 132 bpm, paced exercise resulted in a significant reduction in diastolic filling time

(250 versus 150 msec, p less than 0.05), and insignificant decrease in forward stroke volume (32 versus 39 ml, p=0.06) and cardiac output (4.3 versus 4.7 ml, p=NS).

Conclusions: In severe left ventricular systolic failure cardiac output response to exercise is not enhanced by right atrial pacing at rates higher than spontaneously achieved. This suggests that regulation of diastolic filling period and not the HR may be the predominant physiologic response to exercise in advanced heart failure in order to maintain adequate cardiac output.