

## Testosterone therapy in women with chronic heart failure: a pilot double-blind, randomized, placebo-controlled study.

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#### Abstract

**OBJECTIVES:** The primary objective of this study was to assess the effect of a 6-month testosterone supplementation therapy on functional capacity and insulin resistance in female patients with chronic heart failure (CHF).

**BACKGROUND:** Patients with CHF show decreased exercise capacity and insulin sensitivity. Testosterone supplementation improves these variables in men with CHF. No study has evaluated the effects of testosterone supplementation on female patients with CHF.

**METHODS:** Thirty-six elderly female patients with stable CHF, (ejection fraction  $32.9 \pm 6$ ) were randomly assigned (2:1 ratio) to receive testosterone transdermal patch (T group, n = 24) or placebo (P group, n = 12), both on top of optimal medical therapy. At baseline and after 6 months, patients underwent 6-min walking test (6MWT), cardiopulmonary exercise test, echocardiogram, quadriceps maximal isometric voluntary contraction, dynamic quadriceps isokinetic strength (peak torque), and insulin resistance assessment by homeostasis model.

**RESULTS:** Distance walked at 6MWT as well as peak oxygen consumption significantly improved in the T group, whereas they were unchanged in the P group ( $p < 0.05$  for all comparisons). The homeostasis model was significantly reduced in the T group in comparison with the P group (-16.5% vs. +5%, respectively;  $p < 0.05$ ). Maximal voluntary contraction and peak torque increased significantly in the T group but did not change in the P group. Increase in distance walked at 6MWT was related to the increase in free testosterone levels ( $r = 0.593$ ,  $p = 0.01$ ). No significant changes in echocardiographic parameters were observed in either group. No side effects requiring discontinuation of T were detected.

**CONCLUSIONS:** Testosterone supplementation improves functional capacity, insulin resistance, and muscle strength in women with advanced CHF. Testosterone seems to be an effective and safe therapy for elderly women with CHF.

## Comment in

Testosterone therapy in women with heart failure "why can't a woman be more like a man?". [J Am Coll Cardiol. 2010]

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