

[« Previous](#)[Next Article »](#)[TOC](#)

## Differential Effects of Nonselective Versus Selective $\beta$ -Blockers on Cardiac Sympathetic Activity and Hemostasis in Patients with Heart Failure

**Authors**

---

### Abstract

Carvedilol, a nonselective  $\beta$ -blocker, may be more effective than the selective  $\beta$ -blocker metoprolol in reducing the risk of thromboembolic events in heart failure. The aim of this study was, first, to assess whether there is a differential response in cardiac sympathetic activity by  $^{123}\text{I}$ -meta-iodobenzylguanidine ( $^{123}\text{I}$ -MIBG) imaging when either  $\beta$ -blocker is used. Second, we assessed whether that response correlates with levels of various serum factors that serve as markers for coagulability. **Methods:** In this prospective, randomized, open-label crossover study with masked outcome assessments, stable heart failure patients (left ventricular ejection fraction < 40%) homozygous for the Arg16/Gln27 ( $n = 13$ ) or Gly16/Glu27 haplotype ( $n = 8$ ) of the  $\beta_2$ -receptor were randomized to equipotent dosages of carvedilol or metoprolol for two 6-wk periods. Primary outcome was sympathetic activity as measured by  $^{123}\text{I}$ -MIBG myocardial washout. Secondary outcomes included markers of hemostasis. **Results:**  $^{123}\text{I}$ -MIBG cardiac washout was lower during carvedilol than metoprolol treatment ( $12.9\% \pm 3.9\%$  vs.  $22.1\% \pm 2.8\%$ , respectively,  $P = 0.003$ ), irrespective of  $\beta_2$ -adrenergic receptor haplotype. In addition, treatment with carvedilol resulted in a lower von Willebrand factor than did metoprolol ( $149\% \pm 13\%$  vs.  $157\% \pm 13\%$ , respectively,  $P = 0.01$ ), irrespective of  $\beta_2$ -adrenergic receptor haplotype. **Conclusion:** Compared with metoprolol, carvedilol resulted in greater reduction of sympathetic activity after 6 wk of treatment and lower von Willebrand factor concentrations in both Arg16/Gln27 and Gly16/Glu27 individuals. Therefore, carvedilol may reduce the risk of thromboembolic events in patients with heart failure, irrespective of  $\beta_2$ -receptor haplotype status.

### Keywords

[heart failure](#)  [\$\beta\$ -blockers](#) [genetics, coagulation](#) [sympathetic nervous system](#)

---

## Footnotes

Published online Aug. 22, 2013.

© 2013 by the Society of Nuclear Medicine and Molecular Imaging, Inc.

## Related Article

This Month in JNM: This Month in JNM *J Nucl Med* 2013 **54:7A**

[Full Text](#)

[Full Text \(PDF\)](#)

1. First published August 22, 2013, doi:  
10.2967/jnumed.113.120477 *J Nucl Med* **October 1, 2013** vol.  
54 no. 10 **1733-1739**

- a. » Abstract
- b. [Figures Only](#)
- c. [Full Text](#)
- d. [Full Text \(PDF\)](#)
- e. All Versions of this Article:
  - a. [jnumed.113.120477v1](#)
  - b. 54/10/1733 most recent

**Email me this article**

