

# CONCEPTS IN HYPERTENSION

A Journal Article-Based Approach to Understanding the Clinical Aspects of Hypertension

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## Article of Interest

Messerli F, et al. Body Weight Changes with  $\beta$ -blocker Use: Results from GEMINI. American Journal of Medicine. 2007. (Click to Access)

## Context and Study Objective

The adverse metabolic effects of diuretics were chronicled in a previous issues. However, physicians often overlook similar side effects when prescribing beta-blockers. This article analyzes the association between metoprolol or carvedilol therapy and weight gain among type 2 diabetics.

## Design, Setting, and Participants

-Body weight upon study initiation and termination from the randomized double-blind GEMINI trial were compared. After randomization, carvedilol and metoprolol tartrate were uptitrated to achieve a goal BP of 135/85 mm Hg. Final body weight determinations were made after 5 months on stable doses of each agent. Only those on stable diabetic and anti-hypertensive regimens were eligible.  
-GlaxoSmithKline, the patent holder of carvedilol (Coreg), sponsored the study.

## Results

-1200 patients were randomized with 90% completing the study. The mean age was 61 with 55% being men. Mean HbA1c was 7.2%. BMI was 34 kg/m<sup>2</sup>. The number of additional anti-hypertensives and diabetic agents required during the course of the study were similar between groups.  
-BP fell from 149/86 on entry to 132/77 mm Hg upon study completion. The average carvedilol dose required was 17.5mg BID; average metoprolol tartrate dose was 125 mg BID.  
-After 5 months of therapy, body weight rose 1.2 kg among those prescribed metoprolol but only 0.2 kg among those receiving carvedilol.  
-Table: Those with the highest BMIs upon study initiation experienced the most weight gain.

## Clinical Perspective

-Given hypertensives often suffer from the metabolic syndrome, weight gains of 1-2 kg are meaningful and can worsen insulin resistance and other comorbidities.  
-Since this is a well described class effect, I minimize  $\beta$ -blocker use but if indicated, prescribe metabolically neutral agents such as carvedilol or nebivolol.  
-While this study was conducted in diabetics, similar findings are well documented among non-diabetics.  
-Beta-blockers associated weight gain occurs within the first few months of therapy and is likely dose-dependent.  
-The link beta-blockers and weight gain remains elusive. It may be related to a slowing of one's basal metabolism. How carvedilol avoids an attendant weight gain is unknown.  
-Another neglected side effect of beta-blockers is hypoglycemic unawareness.  
-Disclosures: The study was funded by the patent holder of carvedilol (Coreg). I have no conflicts of interest.

Weight Change by BMI (kg/m <sup>2</sup> )				
	Normal BMI 19-25	Overweight BMI 25-30	Obese BMI 30-40	Morbidly Obese BMI > 40
Carvedilol	0.3 kg	0.0 kg	0.2 kg	0.5 kg
Metoprolol	1.2 kg	0.8 kg	1.1 kg	2.4 kg