

Visit-to-visit systolic blood pressure variability predicts myocardial infarction and congestive heart failure in high-risk hypertensive patients receiving valsartan or amlodipine, independent of mean systolic blood pressure.

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Objective:

High systolic blood pressure variability has been associated with an increased risk of cardiovascular events, and has been shown to be associated with an increased risk of cardiac events in the VALUE trial. In this analysis we aimed to assess if increased visit-to-visit variability in systolic blood pressure increased the risk of myocardial infarction or heart failure in the VALUE trial patient population.

Design and method:

The VALUE trial was a randomised-controlled, double-masked investigation of valsartan versus amlodipine in patients 50 years or older with hypertension and high risk of cardiovascular events. Mean follow-up time was 4.2 years. We calculated the standard deviation (SD) of mean systolic blood pressure from visits 6 months onward, excluding patients with less than 3 visits, or patients with stroke or cardiac events during the first 6 months. In the pooled treatment arms, we grouped SD in quintiles and compared the risk of myocardial infarction and congestive heart failure (fatal/non-fatal events) in the highest and the lowest quintile, using a Cox regression model, adjusting for a number of prognostic variables, including randomised treatment and mean systolic blood pressure from 6 months onwards.

Results:

Of 13.803 patients included, 503 (3.6%) experienced myocardial infarction and 489 (3.5%) experienced congestive heart failure. Compared to patients with the lowest variability, those in the highest quintile had an increased risk of myocardial infarction and congestive heart failure (HR 3.2, 95% CI 2.3–4.3, $p < 0.0001$ and HR 3.1, 95% CI 2.2–4.3, $p < 0.0001$, respectively).

Conclusions:

Visit-to-visit systolic blood pressure variability predicts myocardial infarction and congestive heart failure in high-risk hypertensive patients receiving valsartan or amlodipine, independent of mean systolic blood pressure.