

**NEWS**

## Heart Rate Changes Over Time Hint at Higher Cardiovascular Risk

Each 5-bpm rise in heart rate from the previous clinic visit was linked to a higher risk of death, MI, stroke, and heart failure, report investigators.



By **Michael O'Riordan** January 25, 2018



**A**n increase in heart rate over time is associated with higher risks of cardiovascular and noncardiovascular adverse events including death, according to the results of a large, community-based study.

Importantly, for every additional 5 beats per minute (bpm) in heart rate from the preceding clinic visit, there was a 12% increase in the risk of all-cause mortality, 13% increase in risk of heart failure, and 9% increase in the risk of MI, report investigators. The risk of death from cardiovascular causes,

noncardiovascular causes, and cancer was increased by 13%, 12%, and 8%, respectively, with each 5-bpm increase in heart rate.

“A resting heart rate is an indicator of overall cardiovascular health and if heart rate tends to go up over time, it likely suggests that cardiovascular health is worsening,” said senior investigator Scott Solomon, MD (Brigham and Women’s Hospital, Boston, MA). The increase might be the result of increased sympathetic activity that results from the development of subclinical underlying disease, the investigators suggest.

To TCTMD, Solomon noted that in individuals with existing cardiac disease, particularly those with heart failure, a higher resting heart rate is a known risk factor for adverse events, including mortality and future hospitalizations. The present analysis, which was published January 24, 2018, in *JAMA Cardiology*, extends the prognostic value of changes in heart rate to a more general population.

#### Potential to Be a ‘Very Powerful Biomarker’

Using data from the Atherosclerosis Risk in Communities (ARIC) study, a large, epidemiologic study conducted in four US communities, the researchers assessed baseline heart rate, time-updated heart rate, and changes in heart rate from the preceding visit. The time-updated heart rate was calculated using numbers from clinic visits 1 through 4, meaning each resting heart rate was updated as many as three times after baseline.

Overall, slightly more than one-third of the 15,680 patients had hypertension and 10.5% were taking a beta-blocker, 3.4% were taking a calcium-channel blocker, and 1.6% were taking digoxin—all medications known to limit heart rate.

As a continuous variable, increases in heart rate from the preceding visit were associated with increased risks of all outcomes, including stroke. The association between the change in heart rate and all-cause mortality was “near linear,” report investigators. Higher time-updated heart rate, which they state “represents the most recent [heart rate] before an event or at the end of follow-up,” as well as higher baseline heart rate were also associated with an increased risk of mortality and adverse events.

Use of beta-blockers attenuated the association between the change in heart rate and all-cause mortality, as well as that between time-updated change in heart rate and mortality, such that the links were not statistically significant in these patients.

Nearly every single doctor measures heart rate at each visit, Solomon noted, yet the information is not really used. “We don’t tend to plot it,” he said. “We tend to check if it’s in the normal range, but we might not notice if the resting heart rate goes from 60, for example, to 70 over a period of 5 years. If we were confident in those data that the resting heart rate has really changed, and even though the numbers might be within the ‘normal range,’ that’s a big increase.”

The results suggest physicians should be paying greater attention to changes over time. Solomon noted there are many commercially available devices, such as Fitbits and Apple watches, capable of monitoring heart rate continuously. With this wealth of data available, heart rate “becomes a very powerful biomarker that we can tap into,” he said.

---

## Sources

Vazir A, Claggett B, Cheng S, et al. [Association of resting heart rate and temporal changes in heart rate with outcomes in participants of the Atherosclerosis Risk in Communities Study](#). JAMA Cardiol. 2018;Epub ahead of print.

## Disclosures

Solomon reports research grant funding from Amgen.