In chronic heart failure, monitoring calcitriol may help prevent death

6 March 2015

In patients with chronic heart failure, the vitamin D metabolite 1,25-dihydroxyvitamin D (1,25(OH)2D), also called calcitriol, and its ratio to parathyroid hormone (PTH 1-84) may help predict cardiovascular death; and patients with decreased calcitriol and decreased ratio of calcitriol to PTH might benefit from more aggressive supplementation, a new study finds. The results will be presented Friday, March 6, at ENDO 2015, the annual meeting of the Endocrine Society in San Diego.

Heart failure, with high morbidity and mortality, is increasingly prevalent worldwide, and biomarkers may help doctors predict heart failure and help patients survive.

"This study is important as it identifies and provides physicians with biomarkers that strongly predict cardiovascular death in heart failure and allows them to more intensively and aggressively manage their patients," said lead study author Damien Gruson, PhD, professor and associated laboratory director in the Department of Laboratory Medicine at Cliniques Universitaires Saint Luc in Brussels, Belgium. "We hope that our data can contribute to the more personalized tailored care of heart failure patients."

"We were surprised by the strong predictive power of 1,25(OH)2D and its ratio to 1-84 PTH. It is noteworthy that In this study the 1,25(OH)2D was measured by a novel extraction-free, fully automated assay based on an unique murine monoclonal antibody which recognizes the conformational change induced by the binding of the 1,25(OH)2D to a recombinant fusion protein.

Our results can provide physicians with a new tool - the 1,25(OH)2D to PTH ratio - to risk stratify heart failure patients," said Professor Gruson. "According to the relation between lower ratio values and increased mortality, physicians can try to modulate the ratio by increasing 1,25(OH)2D levels with more supplementation with calcitriol/analogs or by decreasing PTH with aldosterone blockers, for example."

In patients with heart failure, vitamin D deficiency and hyperparathyroidism are common, and evidence is growing for the role of vitamin D and PTH in worsening heart failure.

To examine the ability of calcitriol and its ratio with PTH(1-84) to predict cardiovascular death in chronic heart failure, Professor Gruson and his co-authors investigated 170 chronic heart failure patients. Overall, 36 patients were female, 134 patients were male, and the average age was 67 years. Their overall mean ejection fraction was 23%, and the origin of heart failure was ischemic in 119 patients and dilated cardiomyopathy in 51 patients.

The researchers determined the patients' calcitriol and PTH(1-84) levels at baseline. They found that serum calcitriol levels decreased markedly according to heart failure severity, and that decreased ratios of calcitriol to PTH(1-84) were significantly related to heart failure severity.

After 8 years of follow-up, the calcitriol and the ratio of calcitriol to PTH(1-84) were strongly able to predict the deaths of 106 patients who died from cardiovascular causes.

The authors plan to conduct a larger study to confirm the findings of the benefit of calcitriol supplementation in heart failure patients.

Provided by The Endocrine Society