



ORIGINAL

Parathyroid hormone, calcidiol, calcitriol and adverse events in the acute coronary syndrome[☆]

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KEYWORDS

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Abstract

Objective: To know the clinical profile as well as the prognostic significance of elevated levels of parathyroid hormone (PTH) in patients admitted for acute coronary syndrome (ACS).

Design and setting: Observational and prospective study of patients admitted for ACS in a single Spanish center during a period of six months.

Intervention and variables of interest: The circulating concentrations of PTH, calcidiol, calcitriol, NT-proBNP, C-reactive protein, cystatin C and fibrinogen were determined within the first 48 h at admission. We performed adjusted models to predict death or re-entry for ACS after hospital discharge.

Results: A total of 161 patients were recruited (age 67 ± 14 years, 75.2% were men). Forty-one (25.5%) patients had elevated PTH values. During follow-up for a period of 275 person-years, 50 adverse events were recorded. Patients with elevated PTH levels were proportionally more women (21.2 vs. 39.0%) and older (63.3 vs. 77.8 years, both $p < .05$). Likewise, they presented significantly more cardiovascular risk and a worse prognosis during follow-up (incidence rate ratio 2.64 CI 95%: 1.5–4.6). However, in an adjusted model by the GRACE score, PTH levels were not shown to be an independent risk factor (hazard ratio = 1.1; 95% CI: 0.6–2.2), neither other components of the panel.

Conclusions: The proportion of patients with elevated levels of PTH admitted for ACS was high. The presence of high PTH levels was associated with an unfavorable clinical profile and a worse outcome during the follow-up, although it was not an independent predictor of poor prognosis. © 2017 Elsevier España, S.L.U. and SEMICYUC. All rights reserved.

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PALABRAS CLAVE

Hormona paratiroidea;
Síndrome coronario agudo;
Pronóstico

Hormona paratiroidea, calcidiol, calcitriol y riesgo de eventos adversos en pacientes con síndrome coronario agudo**Resumen**

Objetivo: Conocer el perfil clínico, así como el significado pronóstico, de la presencia de niveles elevados de hormona paratiroidea (PTH) en pacientes ingresados por síndrome coronario agudo (SCA).

Diseño y ámbito: Estudio observacional y prospectivo de pacientes ingresados por SCA en un único centro español durante un periodo de 6 meses.

Intervención y variables de interés: Se determinaron las concentraciones de PTH, calcidiol, calcitriol, NT-proBNP, proteína c reactiva, cistatina C y fibrinógeno circulantes en las primeras 48 h del ingreso y se realizaron modelos ajustados para predecir muerte o reingreso por SCA tras el alta.

Resultados: Se reclutaron 161 pacientes (edad 67 ± 14 años; 75,2% varones) de los cuales 41 (25,5%) presentaron valores elevados de PTH. Se registraron 50 eventos adversos durante un seguimiento de 275 personas-año. Los pacientes con niveles elevados de PTH fueron en mayor proporción mujeres (21,2 vs. 39,0%) y de mayor edad (63,3 vs. 77,8 años, ambos $p < 0,05$). Asimismo, presentaron mayor riesgo cardiovascular y una peor evolución en el seguimiento (razón de tasas de incidencia: 2,64; IC 95%: 1,5-4,6). Sin embargo, en un modelo ajustado por la escala GRACE, los niveles de PTH no se mostraron como un factor de riesgo independiente (*hazard ratio* = 1,1; IC 95%: 0,6-2,2); tampoco el resto de componentes del panel.

Conclusiones: La proporción de pacientes con niveles elevados de PTH ingresados por SCA es elevada. Su presencia se asoció con un perfil clínico más adverso y peor evolución durante el seguimiento, aunque no resultó ser un predictor independiente de mal pronóstico.

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Introduction

Patients with acute coronary syndrome (ACS) constitute a very heterogeneous population, with great variability in terms of both the form of presentation of the syndrome and the risk of death or ischemia recurrence over the long term.¹ The continuous search for new tools offering support for clinicians in assessing the patient prognosis is therefore essential. In addition to purely clinical variables such as cardiovascular history, comorbidities, the electrocardiogram or the presence of heart failure upon admission, biomarkers have become an essential element for diagnosis, patient stratification and management decision making.² The Global Registry of Acute Coronary Events (GRACE) score is routinely used for the risk stratification of patients with ACS, and has been shown to be a potent tool in this respect. However, while its performance in differentiating poor outcome patients is good, it is not perfect – as suggested by its C statistic in the order of 0.8.³ This observation is of particular importance, since any improvements in the discriminating capacity of this score would be of great value in clinical practice.

Both vitamin D, in the form of calcidiol and calcitriol, and parathyroid hormone (PTH) play a key role in bone homeostasis and in the maintenance of calcium-phosphorus balance. Previous studies have demonstrated a relationship between increased cardiovascular risk and the presence of primary⁴ or secondary hyperparathyroidism.⁵ This relationship appears to be largely attributable to an increase in the prevalence of cardiovascular risk factors among patients

with asymptomatic primary hyperparathyroidism.^{6,7} On the other hand, a number of authors have related the presence of high PTH levels to more complex coronary disease⁸; a suboptimum response to antiplatelet medication⁹; and even the presence of a greater number of adverse events during follow-up¹⁰ in patients diagnosed with stable coronary disease. However, the evidence of a potential prognostic impact of PTH in patients with ACS is practically inexistent, and is based only on a small pilot study involving 22 patients.¹¹ No specific study designed to explore this hypothesis has been carried out to date.

The present study was therefore carried out to determine whether measurement of the circulating PTH levels offers prognostic information following the discharge of patients admitted due to ACS. We have also investigated whether the circulating levels of calcidiol and calcitriol are useful for the differentiation of patients at risk of suffering adverse events, and whether such an association persists after controlling for other more solidly established biomarkers such as the amino-terminal fraction of brain natriuretic peptide (NT-proBNP), C-reactive protein (CRP) or cystatin C.

Patients and methods

A prospective, analytical, observational cohort study was carried out with the recruitment of all patients presenting a main diagnosis of ACS admitted between 1 November 2011 and 31 April 2012 to a General University Hospital in Cartagena (Murcia, Spain; latitude 37° N). Patients

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