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ORIGINAL ARTICLE

Proposed clinical scale for the diagnosis of acute coronary syndrome in patients with an inconclusive electrocardiogram and myocardial injury biomarkers[☆]



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KEYWORDS

Chest pain;
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Abstract

Rationale: Acute coronary syndrome (ACS) requires improved diagnostic accuracy through useful, safe and easy-to-apply tools.

Objectives: To obtain an assessment scale for the diagnosis of ACS in patients with chest pain and nondiagnostic electrocardiogram and troponin concentrations.

Methods: A prospective cohort study included 286 patients treated in the emergency department for chest pain, with normal electrocardiogram and troponin levels. Using multiple logistic regression, we obtained the independent predictors for the diagnosis of ACS. The assessment scale's discriminative power was assessed with the area under the ROC curve.

Results: The diagnosis of ACS was confirmed in 103 patients (36%). The final predictive model included 3 endpoints: a history of coronary artery disease, hyperlipidaemia and a score ≥ 6 points on the Geleijnse scale. The area under the ROC curve for the final model was 0.90 (95% confidence interval [95% CI] 0.85–0.93). A threshold of 5 points achieved a sensitivity of 76.7% (95% CI 68–84), a specificity of 91.8% (95% CI 87–95), a positive likelihood ratio of 9.36 (95% CI 5.70–15.40), a negative likelihood ratio of 0.25 (95% CI 0.18–0.36) and an overall diagnostic accuracy of 86.4% (95% CI 82–90). The predictive model was superior to the Geleijnse scale alone.

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PALABRAS CLAVE

Dolor torácico;
Síndrome coronario
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Conclusions: The final scale showed good discriminative capacity for diagnosing ACS and could therefore be of interest for identifying ACS in emergency departments. Nevertheless, the scale needs to be validated in larger multicentre studies.

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Propuesta de una escala clínica para el diagnóstico de síndrome coronario agudo en pacientes con electrocardiograma y biomarcadores de lesión miocárdica no concluyentes

Resumen

Justificación: El síndrome coronario agudo (SCA) requiere una mejora de la precisión diagnóstica mediante herramientas útiles, seguras y fácilmente aplicables.

Objetivos: Obtener una escala de valoración para el diagnóstico de SCA en pacientes con dolor torácico y electrocardiograma y concentraciones de troponina no diagnósticas.

Métodos: Estudio de cohortes prospectivo que incluyó 286 pacientes atendidos en Urgencias por dolor torácico, con electrocardiograma y troponina normales. Mediante regresión logística múltiple se obtuvieron las variables independientes predictoras del diagnóstico de SCA. El poder discriminativo de la escala de valoración se evaluó mediante el área bajo la curva ROC.

Resultados: El diagnóstico de SCA se confirmó en 103 pacientes (36%). El modelo predictivo final incluyó 3 variables: antecedentes personales de enfermedad coronaria, hiperlipidemia y una puntuación en la escala de Geleijnse ≥ 6 puntos. El área bajo la curva ROC para el modelo obtenido fue de 0,90 (intervalo de confianza al 95% [IC 95%] 0,85-0,93). Un umbral de 5 puntos obtuvo una sensibilidad del 76,7% (IC 95% 68-84), una especificidad del 91,8% (IC 95% 87-95), un cociente de probabilidad positivo de 9,36 (IC 95% 5,70-15,40), un cociente de probabilidad negativo de 0,25 (18,00-36,00) y una precisión diagnóstica global del 86,4% (IC 95% 82-90). El modelo predictivo fue superior a la escala de Geleijnse aislada.

Conclusiones: La escala de puntuación obtenida mostró una buena capacidad discriminativa para el diagnóstico de SCA, por lo que podría ser de interés para identificar el SCA en los servicios de Urgencias. No obstante, se precisa su validación mediante estudios multicéntricos más amplios.

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Background

Acute chest pain (ACP) is a common symptom in hospital emergency department (HED) consultations. ACP represents 5–15% of emergency department consultations^{1,2} and creates a significant burden of care and diagnostic problems.³ In Spain, 50% of patients hospitalized for suspected acute coronary syndrome (ACS) are discharged without a diagnostic confirmation.^{1,4,5} Moreover, 2–10% of cases with ACS are sent home after considering the ACP as noncoronary, resulting in a poorer prognosis than for those with ACS identified early.^{1,4,5}

The diagnostic challenge of ACP lies in the fact that its presentation, physical examination and additional tests (electrocardiogram [ECG] and serum biomarkers) are insufficient for discerning whether its origin is coronary. Therefore, there have been efforts to obtain clinical prediction tools based on scales that can help reduce diagnostic errors.

Most of the scales, such as the Thrombolysis in Myocardial Infarction (TIMI) score,⁶ HEART score,⁷ Global Registry

of Acute Coronary Events (GRACE),⁸ Banach Score⁹ and Emergency Department Assessment of Chest Pain Score-Accelerated Diagnostic Protocol (EDACS-ADP),¹⁰ have been designed for risk stratification, prediction of adverse cardiovascular events and mortality or to decide on the initial therapeutic strategies for patients with ACS but have not been validated as diagnostic methods. Geleijnse et al.⁶ (Appendix 1) and, more recently, Boubaker et al.¹² investigated new scales as clinical tools for determining the coronary or noncoronary origin of an ACP.

In Spain, we have studies by Sanchís et al.^{13–16} on the prognostic assessment of long-term coronary risk, but these studies were also not designed to determine the probability of ACS in patients with ACP.

The main objective of this study was to obtain a scale based on clinical variables that is predictive for the diagnosis of ACS and applicable to patients in HEDs who have ACP, whose ECG and troponin values do not confirm the diagnosis.

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