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REVIEW

Prevalence and incidence of hyperkalemia in the Spanish population with heart failure with reduced ejection fraction: A systematic review and populational relevance[☆]

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KEYWORDS

Hyperkalemia;
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Incidence;
Estimate

Abstract

Background and objectives: Hyperkalemia (K^+ levels ≥ 5.5 mmol/L) is a severe ion imbalance that occurs in patients who have heart failure (HF) with reduced ejection fraction (HFrEF) and increases the risk of ventricular fibrillation. Given that there are no estimates on the number of patients with this complication, the aim of this study was to estimate the prevalence and incidence of hyperkalemia in patients with HFrEF in Spain.

Material and methods: Based on a systematic literature search and through a meta-analysis, we calculated an HFrEF prevalence of $\leq 40\%$ in the European and U.S. population. Based on another systematic literature search, we calculated the prevalence of hyperkalemia in patients with HF and its annual incidence rate. Considering the previous values and the Spanish population pyramid in 2016, we estimated the number of individuals with HFrEF who currently have hyperkalemia and those who develop it each year in Spain.

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Results: Approximately 17,100 (10,000 men and 7100 women) of the 508,000 patients with HFrEF in Spain have hyperkalemia. Furthermore, approximately 14,900 patients with HFrEF (9500 men and 5400 women) develop hyperkalemia each year.

Conclusions: Approximately 1 of every 30 patients with HFrEF has plasma potassium values >5.5 mmol/L.

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PALABRAS CLAVE

Hiperpotasemia;
Potasio;
Insuficiencia cardiaca
crónica;
Prevalencia;
Incidencia;
Estimación

Prevalencia e incidencia de hiperpotasemia en población española con insuficiencia cardiaca con fracción de eyección deprimida: revisión sistemática y relevancia poblacional

Resumen

Antecedentes y objetivo: La hiperpotasemia ($K^+ \geq 5,5$ mmol/l) es un desequilibrio iónico grave cuando aparece en pacientes que padecen insuficiencia cardiaca con fracción de eyección deprimida (ICFED), ya que incrementa el riesgo de fibrilación ventricular. No existen estimaciones del número de pacientes que sufren esta complicación. El objetivo de este estudio fue estimar la prevalencia e incidencia de hiperpotasemia en pacientes con ICFED en España.

Materiales y métodos: A partir de una búsqueda bibliográfica sistemática se calculó mediante un metaanálisis la prevalencia de ICFED $\leq 40\%$ en población europea y norteamericana. A partir de otra búsqueda bibliográfica sistemática se calculó la prevalencia de hiperpotasemia en individuos con insuficiencia cardiaca, así como su incidencia anual. Considerando los anteriores valores y la pirámide de población española en 2016 se estimó el número de individuos con ICFED que presentan actualmente y que desarrollan cada año hiperpotasemia en España.

Resultados: Alrededor de 17.100 individuos (10.000 hombres y 7.100 mujeres) de los 508.000 pacientes con ICFED presentan hiperpotasemia en España. Asimismo, unos 14.900 pacientes con ICFED (9.500 hombres y 5.400 mujeres) la desarrollan cada año.

Conclusiones: Aproximadamente uno de cada 30 pacientes con ICFED presenta valores plasmáticos de potasio por encima de 5,5 mmol/l.

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Background

Potassium (K^+) is an essential mineral for numerous physiological functions, including maintaining cell membrane potential. Excess plasma potassium concentrations (hyperkalemia, generally defined as K^+ levels ≥ 5.5 mmol/L) are associated with cell action potential disorders, such as cardiac conduction and excitability,¹ which lead to increased mortality.²⁻⁶

Patients with heart failure (HF) and reduced ejection fraction (rEF) should maintain normal potassium levels, because their disease's substrate aggravates the potential consequences of hyperkalemia and vice versa.^{6,7} These patients usually present other comorbidities that favor the worsening of hyperkalemia (renal failure, type 2 diabetes mellitus). These patients might also be treated with drugs that increase plasma potassium concentrations (angiotensin-converting enzyme inhibitors [ACEIs], angiotensin II-receptor blockers [ARB-II] and mineralocorticoid receptor antagonists [MRAs]).^{6,8} The onset of hyperkalemia precludes the use of therapeutic doses in 4% of patients treated with ACEIs, 2% of those treated with

ARB-II and 8% of those treated with MRAs. Hyperkalemia is also responsible for 7% of contraindications for ACEI and ARB-II and 31% of contraindications for MRA in patients supervised by cardiology units in Spain.⁹

Despite this, the exact number of patients with HF and rEF (HFrEF) who have or develop hyperkalemia every year in Spain is not known. The main objective of this study was to determine this number.

Methods

Estimating the prevalence of heart failure with reduced ejection fraction in the white population

To calculate the number of cases of hyperkalemia in patients with HFrEF in Spain, we needed to determine the number of patients with HFrEF in Spain. The results of the Prevalence of Heart Failure in Spain (PRICE) study¹⁰ showed much higher rates than those reported in other studies conducted in European and US populations, which has been attributed to the study's technical characteristics and not

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