

## ORIGINAL ARTICLE

# Metabolic syndrome and peripheral artery disease: Two related conditions<sup>☆</sup>



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### KEYWORDS

Peripheral artery  
disease;  
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### Abstract

**Aims:** To ascertain the prevalence of metabolic syndrome (MS) in patients with peripheral artery disease (PAD) at the Martorell primary care (PC) center. To analyze the differences in comorbidities and cardiovascular risk factors between patients with PAD with and without MS.  
**Methods:** A cross-sectional, descriptive study on patients diagnosed with PAD according to computerized clinical records of the Martorell PC center. Variables collected included age, sex, high blood pressure (HBP), dyslipidemia (DLP), diabetes (DM), smoking, obesity, cardiovascular disease (CVD), erectile dysfunction (ED), renal failure (RF), and oligoalbuminuria. An analysis comparing patients with and without MS was performed.

**Results:** There were 131 patients diagnosed with PAD, 104 (79%) of whom were male. Sixty-three (48.1%) also had MS. Patients with both PAD and MS had, as compared to those with PAD only, a higher prevalence of HBP (87.3 vs. 60.3%,  $p$ : 0.001), DLP (77.8 vs. 60.3%,  $p$ : 0.03), DM (69.8 vs. 30.9%,  $p$ : <0.001), obesity (25.4 vs. 10.3%,  $p$ : 0.03), CVD (42.9 vs. 19.1%,  $p$ : 0.004), ED (81.3 vs. 54.3%,  $p$ : 0.02), and RF (40.3 vs. 17.9%,  $p$ : 0.006).

**Conclusion:** Patients with both PAD and MS had a higher prevalence of HBP, DLP, DM, and obesity. They also had more cardiovascular events and were significantly associated with pathological conditions highly relevant for cardiovascular prognosis such as erectile dysfunction and chronic kidney disease.

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**PALABRAS CLAVE**

Enfermedad arterial  
periférica;  
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**Síndrome metabólico y enfermedad arterial periférica: 2 enfermedades relacionadas****Resumen**

**Objetivos:** Conocer la prevalencia de síndrome metabólico (SM) en pacientes afectos de enfermedad arterial periférica (EAP) en el centro de Atención Primaria (AP) de Martorell. Analizar las diferencias de comorbilidad y factores de riesgo cardiovascular asociados (FRCV) en pacientes con EAP según presenten o no SM.

**Metodología:** Estudio descriptivo transversal. Sujetos: pacientes diagnosticados de EAP según historia clínica informatizada de AP de Martorell. Mediciones: edad, sexo, hipertensión arterial (HTA), dislipidemia (DLP), diabetes (DM), tabaquismo, obesidad, enfermedad cardiovascular (ECV), disfunción eréctil (DE), insuficiencia renal (IR) y oligoalbuminuria. Análisis: frecuencias para variables discretas, medias y desviación típica (DS) para las variables continuas. Se realizó análisis bivalente que comparaba pacientes que presentaban EAP y SM con los que solo presentaban EAP.

**Resultados:** Un total de 131 pacientes diagnosticados de EAP, 104 (79%) varones. De ellos, 63 (48,1%) presentaron SM, de los que 46 (73%) eran varones. Los pacientes que combinaban EAP y SM, en comparación con los que solo tenían EAP, presentaban mayor prevalencia de HTA (87,3 vs. 60,3%; p: 0,001), DLP (77,8 vs. 60,3%; p: 0,03), DM (69,8 vs. 30,9%; p < 0,001), obesidad (25,4 vs. 10,3%; p: 0,03), ECV (42,9 vs. 19,1%; p: 0,004), DE (81,3 vs. 54,3%; p: 0,02) e IR (40,3 vs. 17,9%; p: 0,006).

**Conclusiones:** Los pacientes que combinan EAP y SM presentan una mayor prevalencia de HTA, DLP, DM y obesidad; padecen más eventos cardiovasculares a nivel cardiaco o cerebral, y se asocian, también de manera significativa a entidades patológicas tan relevantes desde el punto de vista del pronóstico cardiovascular como la DE y la enfermedad renal crónica.

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**Introduction**

Peripheral artery disease (PAD) is defined as the manifestation of atherosclerotic disease in peripheral vascular branches, and preferentially affects arteries in the lower limbs.

PAD is currently regarded as a silent epidemic. It is an underdiagnosed, common condition.<sup>1</sup> A population study conducted in an area very similar to ours found a 7.6% prevalence of PAD.<sup>2</sup> Prevalence exponentially increases from 26% to 54% when patient populations with moderate, high, or very high cardiovascular risk are studied.<sup>3,4</sup>

The potential of PAD as a predictor of cardiovascular disease (CVD) and vascular death is well-known, and there are authors who consider PAD to be the atherosclerotic complication with the worst vital prognosis.<sup>5</sup>

The detection of this condition at an early stage, before it becomes clinically evident, and the adequate management of the cardiovascular risk factors (CVRFs) involved in the genesis of atherosclerosis may help to prevent the occurrence of cardiac or cerebral events, which are today the leading cause of death and disability.<sup>6</sup>

There is ample evidence of the enhancing role of overall cardiovascular risk played by other conditions such as metabolic syndrome (MS), erectile dysfunction (ED), or chronic kidney disease.<sup>7-10</sup> MS is defined as the joint occurrence of factors frequently seen in clinical practice: abdominal obesity, dyslipidemia (DLP), and increased blood glucose and blood pressure (BP) levels. Despite the controversy usually associated with this diagnosis because it is far

from clear that it has a greater predictive value of cardiovascular morbidity and mortality than some of its individual components, many authors have advocated its value as a prognostic marker, regarding it as even greater than that of the established scales for the stratification of cardiovascular risk.<sup>11-13</sup> PAD and MS often occur concurrently,<sup>14-17</sup> and quite a few studies recommend more intensive use of the ankle-brachial index (ABI) in these patients in order to detect undiagnosed cases of vascular disease in the lower limbs and to take appropriate action.<sup>14</sup>

The primary objective of this study was to estimate the prevalence of MS in patients with PAD seen at the Martorell primary care center. The secondary objectives were to analyze any potential differences in behavior of the main CVRFs and other conditions that determine the final risk, such as ED, renal failure (RF), and CVD (ischemic heart disease and cerebrovascular disease) in patients with PAD with or without MS, and to ascertain the degree of control of CVRFs achieved.

**Methods****Study design and population**

This was a descriptive cross-sectional study conducted in 2014 on patients diagnosed with PAD seen at the Martorell (Barcelona) primary care center, covering a population of 30,197, of whom 12.8% were over 64 years of age according

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