



ORIGINAL ARTICLE

Prevalence of masked uncontrolled hypertension according to the number of office blood pressure measurements



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KEYWORDS

Masked hypertension;
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Abstract

Introduction and objectives: The reported prevalence of masked uncontrolled hypertension (MUCH) varies because many studies are not comparable as they use different measurement methodologies. To evaluate the influence of the number of office blood pressure readings on the prevalence of MUCH we conducted a cross-sectional, multicenter study in treated hypertensive patients.

Patients and methods: We carried out an observational, cross-sectional, multicenter study in 33 Spanish hospital-based hypertension units, involving 35 investigators and 12 Autonomous Communities. Six blood pressure readings and a 24-h ambulatory blood pressure monitoring were performed in treated hypertensive patients. The means of the first 3 readings (P_{123}), the 2nd, 3rd and 4th readings (P_{234}), the 3rd, 4th and 5th readings (P_{345}) and the last 3 readings (P_{456}) were compared with mean 24-h blood pressure. MUCH was defined as office blood pressure $<140/90$ mmHg and 24-h blood pressure $\geq 130/80$ mmHg, considering the first 3 readings ($MUCH_{123}$), the 2nd, 3rd and 4th readings ($MUCH_{234}$), the 3rd, 4th and 5th readings ($MUCH_{345}$) and the last 3 readings ($MUCH_{456}$).

Results: We included 498 hypertensive patients. Mean (standard deviation) office blood pressure measurements were: (P_{123}) 141(18)/82(11); (P_{234}) 139(17)/81(11); (P_{345}) 138(17)/81(11) and (P_{456}) 137(16)/80(10) mmHg. Mean 24-h blood pressure was 127(13.8)/75(9.5) mmHg. The correlation coefficients between ambulatory and office systolic/diastolic blood pressure were

Abbreviations: ABPM, 24-h ambulatory blood pressure monitoring; BP, blood pressure; HBPM, self-measured blood pressure monitoring; LVH, left ventricular hypertrophy; MUCH, masked uncontrolled hypertension.

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(P_{123}):0.48/0.50; (P_{234}):0.50/0.52; (P_{345}):0.50/0.54; and (P_{456}):0.50/0.55 ($p < 0.001$, all). The prevalences of MUCH₁₂₃, MUCH₂₃₄, MUCH₃₄₅ and MUCH₄₅₆ were 14.5%, 18.9%, 19.5% and 21.1%, respectively.

Conclusions: The prevalence of MUCH diagnosis depends on the serial office blood pressure readings, being much higher for the last three blood pressure readings. Discarding the first and second office blood pressure measures seems to be the most accurate method for diagnosing MUCH.

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PALABRAS CLAVE

Hipertensión enmascarada;
Hipertensión arterial no controlada;
Medición de la presión arterial en consulta

Prevalencia de hipertensión arterial enmascarada no controlada de acuerdo con el número de medidas de la tensión arterial en consulta

Resumen

Introducción y objetivos: Los datos sobre prevalencia de hipertensión arterial enmascarada no controlada (HTAE) son muy variables, ya que los registros obtenidos en diferentes estudios no son comparables al emplear diferentes métodos de medición. Se llevó a cabo un estudio transversal y multicéntrico en pacientes hipertensos tratados para evaluar la influencia de la cantidad de lecturas de la presión arterial en consulta sobre la prevalencia de la HTAE.

Pacientes y métodos: Se realizó un estudio observacional, transversal y multicéntrico en 33 unidades de hipertensión en hospitales españoles, con la participación de 35 investigadores y 12 comunidades autónomas. Se realizaron 6 lecturas de la presión arterial y un control de la presión arterial ambulatoria de 24 h en pacientes hipertensos tratados. Se compararon las medias de las 3 primeras lecturas (P_{123}), de las lecturas 2, 3 y 4 (P_{234}), de las lecturas 3, 4 y 5 (P_{345}) y de las 3 últimas lecturas (P_{456}) con la media de la presión arterial a las 24 h. Teniendo en cuenta las 3 primeras lecturas (HTAE₁₂₃), las lecturas segunda, tercera y cuarta (HTAE₂₃₄), tercera, cuarta y quinta (HTAE₃₄₅) y las últimas 3 lecturas (HTAE₄₅₆); definimos la HTAE como una presión arterial en consulta $< 140/90$ mm Hg y una presión arterial de 24 h $\geq 130/80$ mm Hg. **Resultados:** Se incluyeron 498 pacientes hipertensos. La media de las mediciones (desviación estándar) de presión arterial en consulta fueron: (P_{123}) 141 (18)/82 (11); (P_{234}) 139 (17)/81 (11); (P_{345}) 138 (17)/81 (11) y (P_{456}) 137 (16)/80 (10) mmHg. La presión arterial media a las 24 h fue de 127 (13.8)/75 (9.5) mmHg. Los coeficientes de correlación entre presión sistólica/presión diastólica ambulatoria y en consulta fueron (P_{123}): 0.48/0.50; (P_{234}): 0.50/0.52; (P_{345}): 0.50/0.54; y (P_{456}): 0.50/0.55 ($p < 0.001$ de todos). Las prevalencias de HTAE₁₂₃, HTAE₂₃₄, HTAE₃₄₅ y HTAE₄₅₆ fueron 14.5%, 18.9%, 19.5% y 21.1%, respectivamente.

Conclusiones: La prevalencia de diagnóstico de HTAE depende de las series de lecturas de la presión arterial en consulta, siendo esta mucho más alta en las 3 últimas lecturas. Si descartamos la primera y segunda lecturas, la medida de la presión arterial en consulta parece ser el método más preciso para el diagnóstico de la HTAE.

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Introduction

Masked uncontrolled hypertension (MUCH) is defined as hypertensive patients receiving antihypertensive treatment with controlled office blood pressure (BP) but high ambulatory BP.¹⁻³ These are hypertensive patients in whom ignorance of poor ambulatory BP control results in a high probability that optimal BP control is delayed for too long.

The diagnosis of MUCH requires a record of 24-h ambulatory BP monitoring (ABPM), although it may be detected using self-measured BP monitoring (HBPM). The reported prevalence of MUCH varies, although many studies are not comparable as they include differing samples of hypertensive patients or use different methodologies. A prevalence of

13.1% of all treated hypertensive patients has been reported in Spanish hypertensive units.⁴ A Japanese study using self-measured blood pressure found a prevalence of 19%.⁵ When only hypertensive patients with good office BP control are evaluated, more than a third may have MUCH as measured by ABPM,⁶⁻⁸ although our experience suggests the prevalence may be as high as 50%.⁹ Banegas et al. found a prevalence of MUCH of 31.1%, significantly higher in males, patients with borderline clinic BP, and patients at high cardiovascular risk.¹⁰ However, other studies have found a prevalence of only 13.4% in this group of patients.¹¹

This variability between studies may be explained, in part, by the different definitions of good ambulatory BP control, according to the selection of mean 24-h or mean

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