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ORIGINAL ARTICLE

Blood pressure control and cardiovascular risk among rural and urban population in Spain

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KEYWORDS
24 h ambulatory blood pressure monitoring (ABPM);
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Abstract Prevalence and control of hypertension seem to be influenced by population, geographical and psychosocial factors.
Aims: To investigate if the places of residence (rural or urban) determine differences in both BP level (office and 24-hour ambulatory BP monitoring (ABPM)) and cardiovascular risk (CVR). We also assess if place of residence establishes differences regarding treatment of the cardiovascular risk patients.
Methods: Data of 25,989 patients from the ABPM National Registry of the Spanish Society of Hypertension were analyzed. Out of them 80.8% ($n = 20{,}998$) were from urban settings and 19.2% ($n = 4991$) from rural settings. Date from subjects less than 65 years of age were analyzed in order to diminish the influence of residence changes following retirement. We measured office BP, 24 h ABPM, cardiovascular risk factors and CVR.
Results: The percentage of patients with BP <140/90 mmHg in the office is higher in the urban group (23.4%) compared to their rural counterparts (21.4%) ($p = 0.003$). This fact lost its statistical significance when BP was measured by ABPM, showing controlled 46.1% in urban and 45.9% in rural settings. The masked hypertension was higher in urban (7.2%) than in rural settings (6.4%). White coat hypertension was more frequent in rural settings (31.6% versus 29.7%, $p < 0.008$). According to estimates of ESH-ESC 2007 guidelines, patients from the rural setting have a higher CVR.
Conclusions: There are no differences in the hypertension control depending on place of residence when this is measured by ABPM. CVR is worse in the rural environment. This fact is linked to a higher level of obesity and its associated metabolic disorders.

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PALABRAS CLAVE
MAPA de 24 h;
Población rural y urbana;
Riesgo cardiovascular;
Control de la PA en consulta;
Control mediante MAPA

Control de la presión arterial y del riesgo cardiovascular en la población rural y urbana de España

Resumen La prevalencia y el control de la hipertensión parecen estar influidos por factores demográficos, geográficos y psicosociales.
Objetivos: Analizar si el lugar de residencia (rural o urbano) marca diferencias tanto en los valores de PA (en consulta y en monitorización ambulatoria de 24 horas [MAPA]) como en el riesgo cardiovascular (RCV). También evaluamos si el lugar de residencia conduce a diferencias en cuanto al tratamiento de pacientes con RCV.
Métodos: Se analizaron los datos de 25.989 pacientes procedentes del Registro Nacional de MAPA de la Sociedad Española de Hipertensión. De ellos, el 80,8% (n = 20.998) procedían de zonas urbanas y el 19,2% (n = 4.991) de entornos rurales. Se analizó la fecha de los pacientes menores de 65 años para disminuir la influencia de los cambios de residencia tras la jubilación. Se midió la PA en consulta, la MAPA de 24 h, los factores de riesgo cardiovascular y el RCV.
Resultados: El porcentaje de pacientes con PA < 140/90 mmHg en consulta era superior en el grupo urbano (23,4%) al compararse con sus contrapartes rurales (21,4%; p = 0,003). Este valor perdía su significación estadística cuando la PA se midió mediante MAPA, con una PA controlada del 46,1% en zonas urbanas y del 45,9% en zonas rurales. La hipertensión enmascarada fue mayor en las zonas urbanas (7,2%) que en las rurales (6,4%). La hipertensión de bata blanca era más frecuente en el medio rural (31,6 frente a 29,7%; p < 0,008). Según las estimaciones de las directrices de la ESH- ESC de 2007, los pacientes en las zonas rurales presentaban un mayor RCV.
Conclusiones: No existen diferencias en el control de la hipertensión en función del lugar de residencia cuando esta se mide mediante MAPA. El RCV es superior en el entorno rural.
Este hecho se vincula a un nivel más elevado de obesidad y a los trastornos metabólicos que ello conlleva.

Introduction

Prevalence and control of hypertension seem to be influenced by population, geographic and psychosocial factors. So far, this influence has not been established. Hypertension does not exist in some isolated primitive cultures and it has a low prevalence in rural societies from parts of the tropics, Africa, China and Southwest Asia. Both Industrialized and developing countries have a growing prevalence of hypertension; they also have many other factors that determine the total cardiovascular risk (CVR), cardiovascular morbidity, and mortality.[1]

In fact, despite the different genetic predisposition, some follow-up studies show a growing prevalence of hypertension when low risk African inhabitants immigrate to Western countries.[2]

Worldwide prevalence of hypertension continues to grow. An increase of 60% is awaited from 2005 to 2025.[3] US data back up that prevalence increases with age, more obvious in women than in men,[4,5] though this trend is not uniform and differences have been observed among different countries. Coopers international study shows differences in prevalence of hypertension among white men ranging from 26.8% in the US up to 55% in Germany.[2]

Chaix et al.[6] reported that, in the most developed countries, educational and social factors could have more influence on blood pressure (BP) knowledge and control than the place of residence. The educational and social factors condition a healthier lifestyle: diet, exercise and use of health resources.

There is growing evidence that link different psychosocial factors to cardiovascular risk factors and also to cardiovascular diseases, specifically to ischemic heart disease.[7]

Therefore, it is important to know the prevalence and the features related to hypertension, its control, and other risk factors in the population belonging to different geographical settings. This would enable to apply adequate medical practice guidelines for each geographical setting, in the case of finding sensible differences.[2,8]

The main objectives of the study are first, to find out whether rural or urban setting conditions a difference in the BP control level, measured in the hypertensive subjects belonging to the Cardiorisc National Program, in both office and 24-hour ambulatory BP monitoring (ABPM), and to know if the place of residence determines the cardiovascular risk profile.

Design, patients and methods

Data for our study were drawn from the ABPM National Registry of the Spanish Society of Hypertension, performed with the collaboration of one thousand professionals belonging to Primary Care and Hypertension Specialist Units. Details from this database have been previously reported.[9] In brief, clinical data and the ABPM record of each patient were sent, via computer system, and registered in a single national database. All the registries which had the variables to be studied (place of residence and occupational status) completed, from June 2004 until August 2009, were analyzed.

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