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Review

Diagnostic and therapeutic approach to the hypertensive crisis☆

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ABSTRACT

High blood pressure is a problem with elevated prevalence in the world population. The acute forms of presentation are "hypertensive crises," which represent a frequent cause for emergency room and primary care consultations.

Hypertensive crises are divided into hypertensive emergencies and hypertensive urgencies, depending on whether or not there is acute damage to the target organ, respectively. Each situation has a different prognosis and treatment. More specifically, hypertensive emergencies are potentially serious and usually require rapid reductions in blood pressure, whereas hypertensive urgencies can be treated as outpatients by reducing blood pressure in hours or days.

A significant number of patients who consult medical professionals regarding a hypertensive crisis do not have a prior diagnosis of hypertension; therefore, it is important to periodically monitor blood pressure levels in the community.

Aproximación diagnóstica y terapéutica de las crisis hipertensivas

Palabras clave:
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Crisis hipertensiva
Emergencia hipertensiva
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RESUMEN

La hipertensión arterial es un problema de elevada prevalencia en la población mundial. Las crisis hipertensivas son las formas agudas de presentación y representan un motivo frecuente de consulta en urgencias y atención primaria.

Las crisis hipertensivas se dividen en emergencias hipertensivas y urgencias hipertensivas, según exista o no daño agudo en órgano diana, respectivamente. Cada situación tiene un pronóstico y tratamiento diferente, siendo las emergencias hipertensivas potencialmente graves, requiriendo por lo general reducciones rápidas de la presión arterial. Por el contrario, las urgencias hipertensivas podrían ser tratadas ambulatoriamente, reduciendo la presión arterial en horas o días.

En un número elevado de pacientes que consultan por una crisis hipertensiva no existen antecedentes de diagnóstico de hipertensión arterial, por lo que es importante incrementar los controles periódicos de la presión arterial en la comunidad.

Introduction

High blood pressure (HBP) is a health problem with a high prevalence around the world. It is considered one of the main cardiovascular risk factors, being one of the most frequent reasons for medical consultation, both in primary care and in hospital emergency departments.[1,2]

In Spain, HBP is a highly prevalent disease. Studies such as ENRICA and DI@BETES estimate prevalence between 33 and 43%, respectively. In these cohorts, approximately half of the subjects were not aware of their condition.[3,4] These levels are very relevant, given that today HBP is a disorder that, according to the World Health Organization, is responsible for 7.1 million deaths a year, despite being a preventable and treatable disease.[5]

With respect to hypertensive crises (HC), they are divided into hypertensive emergencies (HE) and hypertensive urgencies (HU), depending on whether an acute target organ lesion is present or

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absent, respectively. The structural and/or physiological alterations in the target organs can be in heart, brain, kidney, retina and arteries. Cohorts with an HE prevalence of between 2 and 27% have been described.[6,7] In an Italian multicentre study, 333,407 patients admitted to the emergency department were included, in which a total of 1546 were diagnosed with HC and 391 presented HE (25%), highlighting that up to 23% of these patients had no prior history of HBP or was unknown to them.[8]

The objective of this review is to update the clinical and therapeutic aspects of HC. In routine clinical practice, hospital emergency departments have an increasing demand for care. Health professionals need to be able to perform a correct identification, history-taking, physical examination and treatment of HC in a setting where this condition frequently occurs. This would improve the global care of this disorder and probably optimize the dynamics, avoiding long and unnecessary stays in the emergency department.

Definitions

HBP is defined as the chronic elevation of systolic blood pressure (SBP) levels ≥140 mmHg and diastolic blood pressure (DBP) ≥ 90 mmHg, and it is classified in different degrees according to the levels shown at diagnosis (Table 1).

On the other hand, HC is defined as an acute increase in SBP ≥ 180 mmHg and of the DBP ≥ 120 mmHg, capable of causing acute damage to target organs, levels proposed by the committee for the prevention, detection, assessment and treatment of HBP (JNC) VII)[9] and the guidelines of the European hypertension and cardiology societies of 2013, still valid today.[6]

Historically CHs have been divided into 2 groups: HE and HU, and each of them has a different treatment and prognosis. Thus, blood pressure (BP) in HU can be controlled in hours or days with drugs administered orally and outpatiently.[10] On the contrary, HE (Table 2) requires strict control in minutes to hours, usually with drugs administered intravenously.

Within the HC classification we also find the false HC or pseudo HC, which are defined as transient BP elevations due to external stimuli (pain, urinary retention, anxiety, stress, among others), without evidence of acute damage to target organs. Patients with isolated clinical HBP or "white coat HBP", and errors in the BP measurement technique are also classified in this group. Prevalence studies observe a high percentage of pseudo HC, reaching 24–43% in hospital settings, and up to 91% in outpatient settings.[11,12] The symptoms of the trigger usually prevail in their clinical presentation, and their BP levels are generally lower than those observed in a true HC. The pseudo HC treatment is based on rest in the supine position and treatment of the precipitating cause, an outpatient follow-up is recommended to confirm or rule out HBP[13].

Within the HC we must take into account a special subgroup such as HE in pregnancy, which are defined as the acute elevation of SBP ≥ 160 mmHg and/or DBP ≥ 110 mmHg for a period longer than 15 min and also capable of causing acute damage to target organs: preeclampsia, HELLP syndrome (haemolysis, elevated liver enzymes, thrombocytopenia) and eclampsia.[14,15]

Diagnosis

The initial assessment of the patient who comes for HC in many hospitals is performed by nursing staff, either in the *triage* of an emergency service, in a hospital ward or in a primary care clinic, reason why we must work with the medical team in a multidisciplinary way in terms of learning symptoms and warning signs for early identification, so as to avoid direct target organ damage.

History-taking aimed at the possible cause is essential, even in patients who present with levels below the definition of HC, bearing in mind that the acute damage to target organs depends on how quickly the crisis is established and the percentage of BP elevation with respect to the baseline, whereby HE could occur with lower BP values than those proposed by the guidelines. The patient should be asked about episodes of HBP in the past, concomitant or triggering medication, such as non-steroidal anti-inflammatory drugs, recreational drugs, history of sleep apnoea and the presence of some other cardiovascular risk factor; likewise, symptoms or signs that could make us suspect secondary HBP[16] (Table 3).

Symptoms of HC vary widely, from asymptomatic patients or with nonspecific symptoms such as headache, dizziness, vomiting and palpitations, to acute target organ involvement[17].

Physical examination should be detailed, giving priority to cardiac, supra-aortic and abdominal trunks auscultation in search of murmurs that suggest arterial damage and/or aneurysms. Likewise, peripheral pulses, neurological deficit or hypertensive encephalopathy (nausea, vomiting, altered state of consciousness) should be evaluated. Emphasis should be placed on the fundus of the eye, perhaps something that has been forgotten, even though is one of the most useful examinations in this scenario, since it helps to rule out hypertensive retinopathy[18]; in addition, it is important to assess the rest of vital signs, such as oxygen saturation and heart rate. Recent studies have shown that HE usually presents with higher heart rates than HU, with tachycardia being a clinical sign associated with acute left ventricular failure in the context of HE, more specifically a heart rate higher than 100 beats/min.[19]

The complementary tests will be aimed at looking for acute damage in target organs and should be individualized according to the patient: electrocardiogram, chest X-ray, pro-natriuretic brain peptide, to rule out signs of heart failure and/or acute pulmonary oedema, urinalysis (haematuria and proteinuria), cardiac enzymes in case of suspected acute coronary syndrome, brain computed tomography (CT) in case of neurological deficit, thoracic CT angiography and/or Doppler echocardiography if there is suspicion of dissecting aneurysm of the aorta. In HE, the most affected organs are usually the brain (stroke), acute pulmonary oedema and hypertensive encephalopathy.[20]

Table 1
Classification of arterial hypertension, according to the European Societies of Hypertension and Cardiology.

Category	Systolic (mmHg)		Diastolic (mmHg)
Blood pressure level			
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
Normal high	130–139	and/or	85–89
Arterial hypertension			
Grade 1	140–159	and/or	90–99
Grade 2	160–179	and/or	100–109
Grade 3	≥180	and/or	≥110
Isolated systolic	≥140	and	<90

mmHg: millimetres of mercury.