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Review

Acute blood pressure elevation: Therapeutic approach

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ABSTRACT

International guidelines have suggested to avoid the term “hypertensive crisis” for the description of an acute and severe increase in blood pressure (BP) and to consider the definition of ‘hypertensive emergencies’ or ‘hypertensive urgencies’. These two clinical presentations are characterized by the presence of high BP values but imply a different diagnostic and therapeutic approach.

Hypertension awareness, treatment and control are slightly increased in the last years mostly in the United States and in some European nations. Nevertheless the prevalence of hypertensive emergencies is still high and remains associated to a higher mortality.

International Guidelines have also given some recommendations regarding the target BP during treatment and the use of antihypertensive drugs in hypertensive emergencies, although the adherence to these indications is frequently suboptimal.

The present paper is aimed to update the currently available data on the treatment of hypertensive emergencies.

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1. Introduction

The management of an acute increase in BP in a patient with a critical clinical condition is often difficult, because clinicians need to balance the negative impact of BP rise on wall tension in arterial vessels and in the left ventricle and the danger of a too rapid reduction in organ perfusion.

Few randomized clinical trials have been performed in order to establish the adequate approach in the acute hypertensive setting [1–4], as opposed to the large number of observational and interventional studies, on which guidelines indications for treatment of hypertensive patients are based [1,5,6]. Some pathophysiological aspects could guide the therapeutic approach, but the precise mechanisms underlying the acute increase in BP remain still unknown and unpredictable [7–10]. Another complex issue is represented by the large number of patients with longstanding hypertension admitted to the emergency department (ED), that do not need an acute intervention, but only a closer follow-up in the outpatient clinic [11,12]. For these reasons the use of antihypertensive drugs in the ED is still based on individual clinical experience.

The present paper is aimed to update the currently available data on the treatment of hypertensive emergencies.

2. Definition

International guidelines have suggested to avoid the term “hypertensive crisis” for the description of an acute and severe increase in blood pressure (BP) and to consider the definition of ‘hypertensive emergencies’ or ‘hypertensive urgencies’ [1,5,6]. These two clinical presentations are characterized by the presence of high BP values but imply a different diagnostic and therapeutic approach. An hypertensive emergency is an acute increase in BP associated with severe, potentially life-threatening target organ damage (TOD), requiring rapid BP control by the use of intravenous antihypertensive drugs and hospitalization (preferably in an intensive care unit) (Table 1). The most common presentations of hypertensive emergencies are acute stroke, hypertensive encephalopathy, acute hypertensive heart failure, acute coronary syndromes, aortic dissection, sympathetic crises (cocaine toxicity/pheochromocytoma), eclampsia and malignant hypertension. In all these conditions the main objective is to stop the worsening of organ damage and avoid the long-term complications [2,7,13–15].

On the opposite, in the presence of a hypertensive urgency, BP is acutely increased without symptoms suggesting acute organ dam-

Table 1
Hypertensive emergencies.

Hypertensive emergencies	
✓	Hypertensive encephalopathy
✓	Severe hypertension associated to acute target organ damage:
	- acute coronary syndromes
	- pulmonary edema
	- acute aortic dissection
	- intracerebral hemorrhage
	- subarachnoid hemorrhage
	- acute brain infarction
	- acute or rapidly progressing renal failure
✓	Severe hypertension after thrombolysis for ischemic stroke
✓	Pheochromocytoma crisis
✓	Drugs related hypertension (sympathomimetics, cocaine, phencyclidine, phenylpropanolamine, lysergic acid diethylamide, cyclosporin, antihypertensive treatment withdrawal, interaction with MAO inhibitors)
✓	Guillain Barré syndrome
✓	Spinal cord injury
✓	Postoperative bleeding
✓	Post coronary artery bypass hypertension
✓	Eclampsia

age; the reduction of BP values may be reached in hours or even days by oral antihypertensive drugs and patients do not need hospitalization and may be discharged from the ED after a short period of observation.

None of the terms hypertensive emergencies or urgencies corresponds to ICD system codes or implies a reimbursement, while other old terms (malignant and accelerated hypertension) may be still used for reimbursement and coding [16]. It has been suggested that these definitions might be responsible, at least in part, for the increase in hospital admissions for malignant hypertension [17].

An increase in BP above 180 mmHg and/or 120 mmHg may indicate the presence of an hypertensive emergency or urgency, although in some cases the distinction is not strict, since the unrecognized or undertreated hypertensive urgency may evolve into an emergency.

The value of systolic and diastolic BP for the definition of these conditions are not generally accepted and slightly different thresholds have been used. In the “Studying the Treatment of Acute hypertension” (STAT) registry, hypertensive emergency or urgency were defined if SBP and or DBP were >180/110 mmHg, or if SBP and/or DBP were $\geq 140/\geq 90$ mmHg only in patients with subarachnoid hemorrhage [18].

In non-stroke patients [19], mean BP of patients receiving intravenous antihypertensive drugs was 180.9 (range 105–220) mmHg as observed in a survey examining the management of acute BP rise by a large group of physician and pharmacists, all members of the Society of Critical Care Medicine and the American College of Clinical Pharmacy.

The distinction between an hypertensive urgency and ‘uncontrolled hypertension’ may be particularly difficult, if the velocity of the rise in BP remains unknown. Moreover, in several patients with chronic elevation of BP values, often due to poor antihypertensive treatment adherence, a sudden increase in BP may be induced by anxiety, alcohol withdrawal, pain, venous epistaxis.

3. Epidemiology

Available data indicate that the prevalence of hypertensive emergencies ranges from 2 to 3% of hypertensive patients [20–22] while the mortality rate associated to this condition has declined in the past 40 years. The prevalence ratio of hypertensive emergencies and urgencies is about 1–3/1–4, respectively.

The incidence of cardiovascular events is high in both hypertensive emergencies and urgencies [21,23,24]. In the United States the incidence of hospitalization for a hypertensive emergency has increased in the year interval 2000–2007, but a decline in mortality has been reported. The stronger predictors of mortality for these patients were older age, male sex and Charlson comorbidity index [25]. In the “Studying the Treatment of Acute hypertension” (STAT) registry hospital mortality and 90 day readmission rate were, 6.9% and 37%, respectively [18], being the last mainly associated to low adherence to antihypertensive drugs, substance abuse and end-stage renal disease [26].

A recent study has evaluated 58 535 patients (mean age 63.1 years, 57.7% women and 76% were white) with an hypertensive urgency [27]. No significant difference in the occurrence of major cardiovascular events at 7 days nor at 6 months were observed as compared with the general population of hypertensive patients, and Authors concluded that hypertensive urgency is common, with a low rate of major cardiovascular events. The study also showed that patients referred to the ED were more frequently hospitalized, without an improvement in outcome; in addition the prevalence of uncontrolled hypertension was 65%, when evaluated 6 months after admission.

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