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## PRESENTATION OF DE NOVO CASES AND CASES WITH PRE-EXISTING CHRONIC HYPERTENSION IN DIFFERENT TYPES OF HYPERTENSIVE CRISES

### PREZENTACIJA DE NOVO I SLUČAJEVA SA PRETHODNOM HRONIČNOM HIPERTENZIJOM KOD RAZLIČITIH TIPOVA HIPERTENZIVNIH KRIZA

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**Summary:** INTRODUCTION: Hypertensive urgencies typically manifest with nonspecific symptoms since there is no damage to vital organs, in contrast to hypertensive emergencies, where organ damage causes specific symptoms. Exceptions can pose problems during triage. The aim of this study was to present the differences in clinical presentation between de novo cases and those with pre-existing chronic hypertension. MATERIAL AND METHODS: The retrospective analysis included 305 consecutive patients with hypertensive crises who presented to the Emergency Medicine Clinic of the Clinical Center of the University of Sarajevo over a period of six months. RESULTS: Patients with pre-existing chronic hypertension were more numerous (85.57%) than de novo cases (14.43%). De novo cases did not statistically differ from patients with a history of hypertensive crisis in the frequency of presentation with specific symptoms in the hypertensive urgency group ( $p=0.35$ ). There were no asymptomatic patients with de novo disease, while approximately one-fifth of patients with pre-existing chronic hypertension were asymptomatic (20.1%). De novo patients statistically presented more frequently with nonspecific symptoms in hypertensive emergencies compared to other group ( $p=0.018$ ). CONCLUSION: Patients with de novo hypertensive crisis more often present with milder symptoms, but never without symptoms. In hypertensive emergencies, they more frequently present with nonspecific symptoms, which can lead to misdiagnosis, especially in prehospital conditions where complete diagnostic assessment is not possible.

**Key words:** de novo, previous hypertension, symptoms

## INTRODUCTION

A hypertensive crisis is a condition characterized by acutely elevated blood pressure: systolic  $\geq 180$  mmHg and/or diastolic  $\geq 120$  mmHg [1]. There are two types of hypertensive crises: hypertensive urgency and hypertensive emergency. Hypertensive urgency (HU) is a milder form, characterized by elevated blood pressure and accompanying non-specific symptoms, as opposed to hypertensive emergency (HE), in which elevated blood pressure has caused what is known as Hypertensive-Mediated Organ Damage (HMOD) with symptoms specific to the affected organ. The therapeutic approach also differs between these types. HU is treated on an outpatient basis and does not require intravenous therapy, unlike HE, which requires hospitalization and intravenous medication administration [2,3]. HU usually presents with a milder clinical picture and nonspecific symptoms such as headache, dizziness, vomits, palpitations etc. HE presents with a more severe clinical picture and specific symptoms depends on localisation of HMOD-a (eyes, heart, brain, kidneys) [4]. However, reverse cases do exist, so clinical presentation alone is insufficient to distinguish these two types. HE can only be reliably diagnosed after performing the necessary diagnostics and confirming HMOD.

The above highlights that the triage of hypertensive crises can present a challenge for emergency medicine physicians, especially at the pre-hospital level, due to the lack of necessary diagnostic tools and the absence of clear guidelines to facilitate this process [5]. Therefore, research is needed to identify factors that could potentially aid in recognizing the types of hypertensive crises.

A hypertensive crisis may occur in individuals who already have chronic hypertension, but it can also occur de novo in previously healthy individuals, or at least those without verified chronic hypertension [6]. This raises the question of whether there are differences in the presentation and severity of hypertensive crises between these groups and whether the

presence or absence of chronic hypertension could assist in triage at the pre-hospital level. The aim of this study was to address this question to facilitate the management of such cases in the emergency department.

## MATERIAL AND METHODS

A retrospective analysis was conducted on 305 patients with hypertensive crises, consecutively included, who presented to the Emergency Medicine Clinic of the Clinical Center of the University of Sarajevo over a 6-month period. Patient data were collected from the hospital's electronic BIS system.

Inclusion criteria: age  $\geq 18$  years, both male and female, systolic blood pressure  $\geq 180$  mmHg or diastolic  $\geq 120$  mmHg, and complete medical documentation.

Exclusion criteria: age  $\leq 18$  years, pregnancy, incomplete medical documentation, and death before completing the diagnostics required for determining organ damage.

Collected data included: gender, age, history of prior chronic hypertension, presenting symptoms, data on diagnostic procedures performed, and their outcome in terms of the presence of organ damage.

Data processing was performed using the IBM SPSS system, employing the Chi-square test as well as descriptive statistics (percentage, mean value). A p-value  $< 0.05$  was considered statistically significant. The data were presented in tables and graphs.

## RESULTS

The proportion of men and women is approximately equal (51.1% vs. 48.9%), with a predominance of middle-aged and elderly patients. The mean age is 64.68 years ( $\pm 13.84$ ). (Table 1)

Patients with a history of chronic hypertension are more prevalent (85.57%) compared to de novo cases (14.43%). (Figure 1)

Hypertensive urgencies were significantly more prevalent (73.77%) compared to hypertensive emergencies (26.23%) (Figure 2).

Table 1. Demographic Data of Patients with Hypertensive Crises (N=305)			
Gender			
Men N(%)		Women N(%)	
156 (51.1)		149 (48.9)	
Age (yr)			
Minimum	Maximum	Mean	St. dev.
18	92	61.68	19.54

Table 1. Demographic Data of Patients with Hypertensive Crises (N=305)

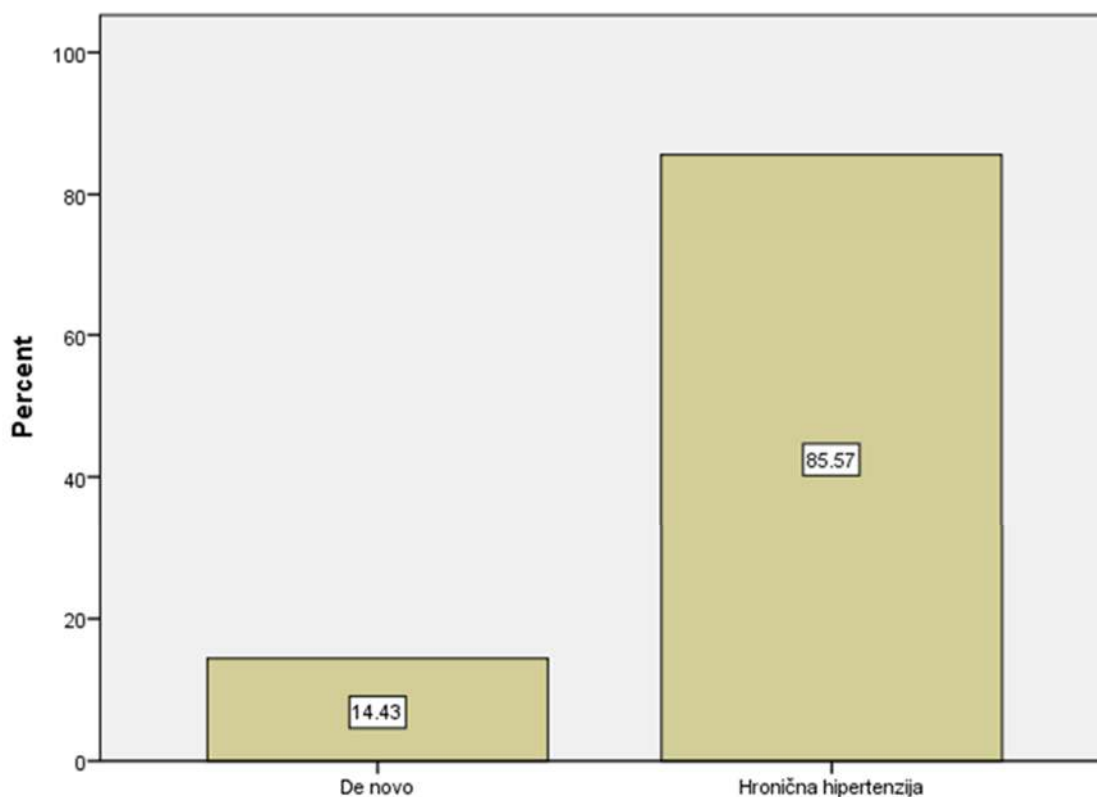


Figure 1. Distribution of de novo cases and patients with a history of chronic hypertension

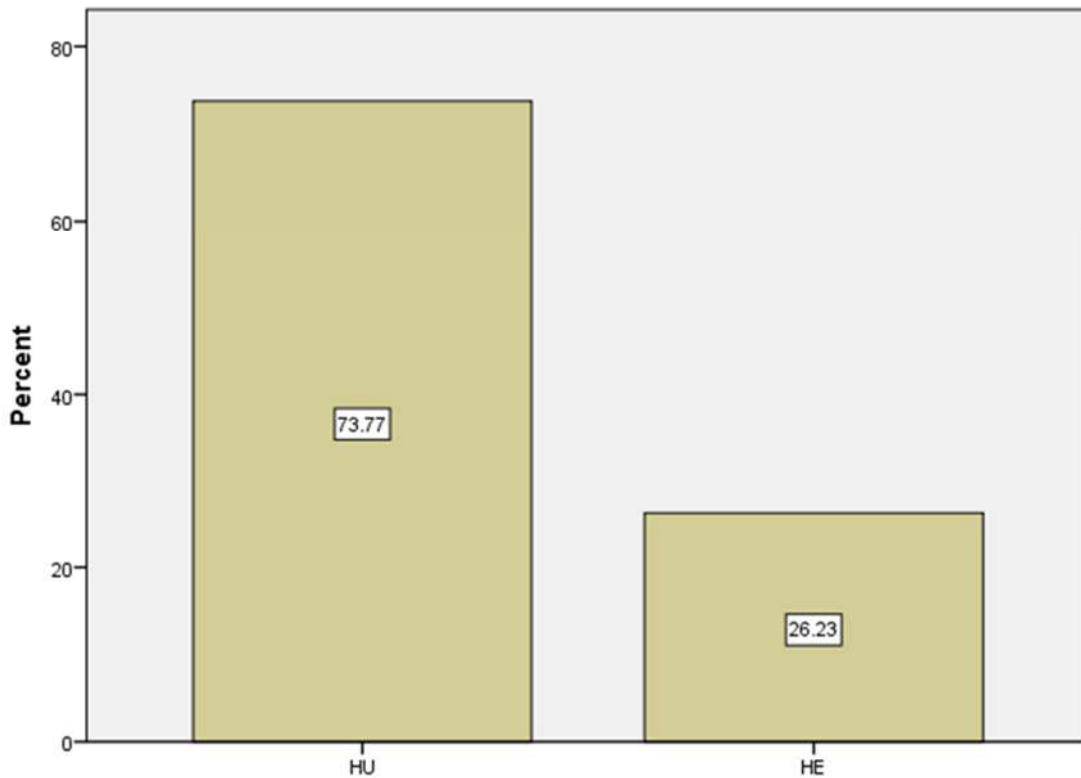


Figure 2. Distribution of Types of Hypertensive Crises

The analysis of the group of patients with hypertensive urgencies revealed that the subgroup with pre-existing chronic hypertension had a significantly higher proportion of patients with specific symptoms (40.2%) compared to the de novo subgroup (30.8%). Conversely, the de novo subgroup had a higher proportion of patients with non-

specific symptoms (69.2%) compared to the other subgroup (39.7%). However, the de novo subgroup had no asymptomatic patients (0.0%), in contrast to the subgroup with pre-existing chronic hypertension, which had a significant proportion of asymptomatic patients (20.1%) (p=0.006) (Table 2).

Variable	Specific symptoms N(%)	Non-specific symptoms N(%)	Asymptomatic N(%)	Total	p-value*
De novo	8 (30.8%)	18 (69.2%)	0 (0.0%)	26	0.006
Chronic hypertension	80 (40.2%)	79 (39.7%)	40 (20.1%)	199	

\*P-value Chi-Square test

Table 2. Types of Symptoms in De Novo Patients and Those with Previous Chronic Hypertension in the Hypertensive Urgencies Group (N=225)

Table 3: Types of Symptoms in De Novo Patients and Those with Previous Chronic Hypertension in the Hypertensive Emergencies Group (N=80)					
Group	Specific symptoms N(%)	Nonspecific symptoms N(%)	<u>A</u> symptomatic N(%)	Total	p-value*
De novo	8 (44.4%)	10 (55.6%)	0 (0.0%)	18	0.018
Chronic hypertension	46 (74.2%)	16 (25.8%)	0 (0.0%)	62	
*P-value Chi-Square test					

Table 3: Types of Symptoms in De Novo Patients and Those with Previous Chronic Hypertension in the Hypertensive Emergencies Group (N=80)

## DISCUSSION

The sample of 305 patients analyzed in this study had a nearly equal gender distribution, consistent with findings from a recent study on hypertensive crises [7], although some studies reported a slight predominance of either women [8] or men [9]. The age of participants in these studies was comparable to that of this sample.

Patients with pre-existing chronic hypertension predominated, which was expected and aligns with other studies' findings. However, the proportion of de novo cases (14.43%) was lower than in other studies, although the available literature on this subject is limited. For comparison, an Italian study reported 23% [10], and a South African study reported 36% [11]. These variations in de novo cases may stem from genetic predispositions, lifestyle differences, healthcare advancements, or study design and participant selection. Notably, this study focused on patients presenting to the Clinic of Emergency Medicine at the Clinical Center University of Sarajevo, which may be a limiting factor, as other prehospital and hospital facilities in the same region might also treat hypertensive crises.

The sample demonstrated a predominance of hypertensive urgencies (73.77%) over hypertensive emergencies (26.23%), consistent

with similar studies investigating the prevalence of hypertensive crisis types [12,13]. Despite extensive research on the presentation and management of hypertensive crises, there is limited literature on the determinants of organ damage. The pathophysiological mechanisms underlying hypertensive crises primarily involve dysfunction of the renin-angiotensin-aldosterone system, endothelial dysfunction, and oxidative stress, which contribute to the sudden rise in blood pressure that may lead to organ damage [14]. However, the role of other, unexplored factors remains unclear. Moreover, there is no evidence in the literature of differences in the pathophysiology of blood pressure elevation or organ damage between patients with chronic hypertension and those previously normotensive. Other factors, such as cardiovascular comorbidities, diabetes, gender, and age, may also influence the occurrence of hypertensive crises [15].

Identifying hypertensive crisis types is challenging, particularly in prehospital settings, where diagnosis and triage depend on clinical presentation and available diagnostic tools. The absence of CT imaging complicates the detection of organ damage [16]. While the literature suggests that hypertensive emergencies often present with specific symptoms and hypertensive urgencies with

non-specific symptoms [4], this is not always the case, as demonstrated in this study.

To identify potential triage aids, this study analyzed differences in the clinical presentation of hypertensive crisis types concerning the presence or absence of pre-existing chronic hypertension. Among patients with hypertensive urgencies, those with chronic hypertension were more likely to present with specific symptoms and even asymptomatic episodes. The latter finding lacks explanation in the literature. Conversely, all de novo patients were symptomatic, primarily with non-specific symptoms, likely due to heightened sensitivity to a sudden rise in previously normal blood pressure. The milder symptoms observed in this group may reflect the absence of chronic organ damage, which is common in long-standing hypertension [17].

In the hypertensive emergency group, a significant proportion of patients exhibited non-specific symptoms, particularly de novo patients. Asymptomatic presentations were absent, consistent with other studies on hypertensive emergency presentations [18], likely because organ damage invariably causes symptoms.

These findings suggest that patients with de novo hypertensive crises tend to have milder clinical presentations, both in hypertensive urgencies and emergencies, but are never

asymptomatic. The milder symptoms may result from the absence of prior chronic organ damage, while the lack of asymptomatic cases could be due to the organism's reaction to a sudden and unfamiliar rise in blood pressure in previously normotensive individuals.

#### CONCLUSION

De novo patients more frequently present with non-specific symptoms compared to those with chronic hypertension but are never asymptomatic. Attention is required when determining the type of hypertensive crisis in such patients due to the frequent presentation of non-specific symptoms in cases of hypertensive emergencies. This can lead to misdiagnosis, missed organ damage, administration of outpatient treatment, and discharge, potentially resulting in fatal outcomes.

Patients with pre-existing chronic hypertension more often present with specific symptoms in cases of hypertensive urgencies, which can also lead to misdiagnosis. However, the consequences in this scenario are less severe, as these patients will typically be referred to a hospital setting where further diagnostics will rule out organ damage, preventing inappropriate treatment.

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## PRESENTACIJA DE NOVO I SLUČAJEVA SA PRETHODNOM HRONIČNOM HIPERTENZIJOM KOD RAZLIČITIH TIPOVA HIPERTENZIVNIH KRIZA

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**Sažetak:** UVOD: Hipertenzivne urgencije se najčešće prezentuju nespecifičnim simptomima jer nema oštećenja vitalnih organa za razliku od hipertenzivnih emergencija gdje oštećenje organa uzrokuje specifične simptome. Postoje izuzeci što može predstavljati problem prilikom trijaže. Cilj ove studije je bio prikazati razlike u kliničkoj prezentaciji de novo slučajeva i onih sa prethodnom hroničnom hipertenzijom. MATERIJAL I METODE: Retrospektivna analiza je uključila 305 konsektivnih pacijenata koji su se javili na Kliniku urgentne medicine, Kliničkog centra Univerziteta u Sarajevu u šestomesečnom periodu. Pacijenti sa prethodnom hroničnom hipertenzijom su bili znatno brojniji (85.57%) od de novo slučajeva (14.43%). De novo slučajevi se nisu statistički signifikantno razlikovali od onih sa hroničnom hipertenzijom u učestalosti prezentacije specifičnim simptomima u grupi hipertenzivnih urgencija ( $p=0.35$ ). U ovoj grupi nije bilo asimptomatskih de novo slučajeva dok je približno petina pacijenata sa hroničnom hipertenzijom bila asimptomatska (20.1%). De novo pacijenti su se signifikantno češće prezentovali nespecifičnim simptomima u grupi hipertenzivnih emergencija u odnosu na one sa hroničnom hipertenzijom ( $p=0.018$ ). ZAKLJUČAK: Pacijenti sa de novo hipertenzivnim krizama se češće prezentuju blažim simptomima ali nikad asimptomatski. U slučajevima hipertenzivnih emergencija de novo pacijenti se češće prezentuju nespecifičnim simptomima što može dovesti do pogrešne dijagnoze pogotovo u prehospitalnim uslovima gdje nije moguća potpuna dijagnostička obrada.

**Ključne reči:** de novo, prethodna hipertenzija, simptomi

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