Čimbenici kardiovaskularnog rizika povezani s arterijskom hipertenzijom u ambulanti hitne medicinske pomoći

Cardiovascular Risk Factors Associated with Arterial Hypertension in an Emergency Medical Care

Elvedin Osmanović[1]*, Almir Jagodić[1], Irma Ikanović[2], Hidajet Rahimić[1], Nadina Kurtanović[3], Almina Mujačić[1]

[1]JZU Dom zdravlja Živinice, Živinice, Bosna i Hercegovina
[2]Zavod za hitnu medicinsku pomoć Sarajevo, Sarajevo, Bosna i Hercegovina
[3]Zdravstvena Ustanova Lječilište „GATA" Bihać, Bihać, Bosna i Hercegovina

[1]Public Health Center Živinice, Živinice, Bosnia and Herzegovina
[2]Emergency Medical Care, Institute of Emergency Medicine, Sarajevo, Bosnia and Herzegovina
[3]Health institution Spa Gata Bihać, Bihać, Bosnia and Herzegovina

SAŽETAK: Arterijska hipertenzija (AH) stanje je u kojemu je arterijski tlak (AT) povišen iznad 139/89 mmHg. Visoki AT ubrzava proces ateroskleroze u stijenkama krvnih žila. Sužene arterije imaju lošiju opskrbu tkiva i organa krvlju te se s vremenom oštećuju i pogoršava im se funkcija. Brojni su čimbenici za koje se pokazalo da pridonose nastanku AH-a, kao što su stres, genski čimbenici, pušenje, alkohol, no i prekomjerna tjelesna težina ima vodeću ulogu u nastanku AH-a. Istraživanje je provedeno na 160 ispitanika obaju spolova, starijih od 18 godina, u JZU Dom zdravlja Živinice. Stres i pušenje bili su vodeći čimbenici rizika u ispitanika s AH-om, a bili su prisutni (pojedinačno ili u kombinaciji) u 37,4 % ispitanika. U kontrolnoj skupini (normotenzivnih) ispitanika njih 18 (45,0 %) nije imalo nijedan od uočenih čimbenika rizika. Uočena je znatna razlika u vrijednostima indeksa tjelesne mase između promatranih skupina i normotenzivnih ispitanika.

SUMMARY: Arterial hypertension (AH) is a medical condition in which blood pressure (BP) is elevated above 139/89 mmHg. High BP accelerates the process of atherosclerosis in the walls of blood vessels. Clogged arteries provide reduced blood supply to tissues and organs, damaging them and their function over time. Numerous factors have been shown to contribute to development of AH, such as stress, genetic factors, smoking, and alcohol, but being overweight also has a leading role in AH development. We conducted a study on 160 participants of both sexes, aged over 18, at the JZU Health Center Živinice. Stress and smoking were leading risk factors in participants with AH, and were present (individually or in combination) in 37.4% of participants. In the control group of (normotensive) participants, 19 (45.0%) had none of the observed risk factors. A significant difference was observed in body mass index between the study group and normotensive controls.

KLJUČNE RIJEČI: arterijska hipertenzija, čimbenici rizika, hitna medicinska pomoć.

KEYWORDS: arterial hypertension, risk factors, emergency medicine.

CITATION: Cardiol Croat. 2022;17(5-6):102-8. | https://doi.org/10.15836/ccar2022.102

***ADDRESS FOR CORRESPONDENCE**: Elvedin Osmanović, Ul. Mehmedalije Maka Dizdara 35, 75000 Tuzla, Bosnia and Herzegovina. / Phone: +38761424904 / E-mail: elvedin.osmanovic79@gmail.com

ORCID: Elvedin Osmanović, https://orcid.org/0000-0002-3463-2431 • Almir Jagodić, https://orcid.org/0000-0002-8102-4041
Irma Ikanović, https://orcid.org/0000-0001-7586-467X • Hidajet Rahimić, https://orcid.org/0000-0002-9580-4719
Nadina Kurtanović, https://orcid.org/0000-0001-8533-4752 • Almina Mujačić, https://orcid.org/0000-0003-2368-1569

TO CITE THIS ARTICLE: Osmanović E, Jagodić A, Ikanović I, Rahimić H, Kurtanović N, Mujačić A. Cardiovascular Risk Factors Associated with Arterial Hypertension in an Emergency Medical Care. Cardiol Croat. 2022;17(5-6):102-8 | https://doi.org/10.15836/ccar2022.102

TO LINK TO THIS ARTICLE: https://doi.org/10.15836/ccar2022.102

RECEIVED:
May 19, 2022
UPDATED:
May 27, 2022
ACCEPTED:
June 7, 2022

Arterijska hipertenzija (AH) stanje je u kojemu je arterijski tlak (AT) povišen iznad 139/89 mmHg. Gornja vrijednost AT-a predočuje sistolički tlak, tj. tlak na stijenkama krvnih žila nastao zbog sistole (kontrakcije) lijeve klijetke[1]. U osoba s AH-om dolazi do ubrzanog razvoja ateroskleroze i promjena na krvnim žilama i u drugim organima u tijelu. Stoga se AT >140/90 mmHg mora liječiti kako bi se izbjegao razvoj ateroskleroze i naknadno oštećenje ciljnih organa[2].

Arterial hypertension (AH) is a medical condition in which blood pressure (BP) is elevated above 139/89 mmHg. The upper value represents systolic pressure, i.e. pressure on the walls of blood vessels occurring due to systole (contraction) of the left ventricle[1]. Persons with AH experience accelerated development of atherosclerosis and changes in blood vessels and other organs in the body. Therefore, BP >140/90 mmHg must be treated to avoid the development of atherosclerosis and consequent damage to target organs[2].

Epidemiologija i utjecaj arterijske hipertenzije

Epidemiološkim je istraživanjima utvrđena važna i neovisna veza između visokog AT-a i raznih bolesti, posebice koronarne bolesti srca, moždanog udara, kongestivnog zatajivanja srca i poremećene funkcije bubrega. Mnoga istraživanja provedena među pripadnicima obaju spolova u različitim populacijama otkrila su da postoji jaka povezanost između AT-a i kardiovaskularnih (KV) bolesti. Rizik se progresivno povećava povećanjem AT-a. Opća incidencija AH-a kreće se od 1 do 2 % u drugom i trećem desetljeću života do 4 do 8 % u šestom i sedmom desetljeću života. Prevalencija AH-a u starijih od 35 godina iznosi 27,8 % u Sjedinjenim Državama i 44,2 % u Europi (49 % u Finskoj, 47 % u Španjolskoj, 38 % u Švedskoj i 38 % u Italiji). Prevalencija AH-a u Hrvatskoj je 39 % za muškarce i 37 % za žene. Incidencija AH-a u Bosni i Hercegovini veća je od 30 %, što, prema statističkim procjenama, iznosi oko 200 000 hipertoničara[3].

Sužene arterije slabije opskrbljuju tkiva i organe krvlju, a s vremenom nastaje njihovo oštećenje i pogoršava im se funkcija. Zbog ishemije tkiva i organa, srce se povećava u minutnom volumenu kako bi osiguralo dovoljno kisika, što dodatno povećava AT[4]. Nastali aterosklerotski plakovi u stijenkama krvnih žila pucaju jer postaju neelastični i na tom mjestu nastaje tromb koji zatvara krvnu žilu[5]. AT se često postupno povećava, pa bolesnik ne osjeća nikakve simptome sve dok se ne pojave neke od komplikacija AH-a, poput infarkta miokarda i moždanog udara[6].

Čimbenici kardiovaskularnog rizika

Mnogo je čimbenika za koje se pokazalo da pridonose nastanku AH-a, poput stresa, genetike, pušenja, alkohola, no sigurno je da pretilost ima vodeću ulogu u nastanku AH-a u većine ispitanika. Pretilost, sjedilački način života, stres, prekomjerna konzumacija alkohola ili prekomjerna konzumacija slane i masne hrane, mogu imati važnu ulogu u razvoju AH-a[7]. Ovi se uzroci također mogu nazvati promjenjivim uzrocima AH-a jer se na njih može utjecati. Promjenom bilo kojeg od gore navedenih uzroka AH se može izbjeći ako ne postoji nasljedni, nepromjenjivi uzrok. Neka istraživanja ukazuju da stres može uzrokovati povremenog povišenje AT-a. Naime, stres aktivira biokemijske procese u tijelu koji uzrokuju vazokonstrikciju krvnih žila zbog lučenja određenih hormona i na taj način dijelom objašnjava mehanizam nastanka AH-a. Mnoga su istraživanja dokazala povezanost AH-a i čimbenika rizika koji imaju velik utjecaj na nastanak i daljnji razvoj[8,9].

Ciljevi su ovog istraživanja bili: a) utvrditi odstupanje vrijednosti AT-a u novodijagnosticiranih, neliječenih i neadekvatno liječenih hipertoničara od normalnih vrijednosti; b) upozoriti na važnost probira na AH u hitnoj medicinskoj pomoći u otkrivanju novodijagnosticiranih slučajeva bolesti te u liječenju većega broja bolesnika.

Ispitanici i metode

U Službi hitne medicinske pomoći JZU Dom zdravlja Živinice u razdoblju od 1. siječnja do 30. travnja 2022. provedeno je istraživanje koje je ispitivalo učestalost pojavljivanja bolesnika s AH-om, te čimbenike kardiovaskularnog rizika važne za razvoj AH-a. Formirane su četiri skupine kao uzastopni

Epidemiology and the development of arterial hypertension

Epidemiological studies have demonstrated an important and independent association between high BP and various diseases, especially coronary heart disease, cerebrovascular stroke, congestive heart failure, and altered renal function. Many studies conducted on members of both sexes in different populations have found that there is a strong association between BP and cardiovascular (CV) diseases. Risk progressively increases with increased BP. The overall incidence of AH is between 1% and 2% in the second and third decade of life and 4% to 8% in the sixth and seventh decade of life. The prevalence of AH in persons above the age of 35 is 27.8% in the USA and 44.2% in Europe (49% in Finland 47% in Spain, 38% in Sweden, and 38% in Italy). The prevalence of AH in Croatia is 39% in men and 37% in women. The incidence of AH in Bosnia and Herzegovina is above 30%, which is approximately 200,000 persons with hypertension according to statistical estimates[3].

Clogged arteries provide reduced blood supply to tissues and organs, damaging them and deteriorating their function over time. Due to tissue and organ ischemia, the minute volume of the heart increases in order to secure sufficient oxygen supply, further increasing BP[4]. The atherosclerotic plaque that has formed in blood vessel walls breaks apart due to insufficient elasticity, causing the formation of a thrombus that closes the blood vessel[5]. BP often increases gradually, and the patient may not notice any symptoms until one of the complications of AH arises, such as myocardial infarction and stroke[6].

Cardiovascular risk factors

There are many risk factors that have been shown to contribute to the development of AH, such as stress, genetics, smoking, and alcohol, but it is clear that overweight has a leading role in the development of AH in most study participants. Obesity, a sedentary lifestyle, stress, excessive consumption of alcohol, or excessive consumption of salty and fatty food can play a significant role in the development of AH[7]. These causes can also be classified as modifiable causes of AH, since they can be influenced. Changing any of these habits listed above can avoid AH development if there is no hereditary, non-modifiable cause. Some studies have shown that stress can lead to occasional BP increases. Namely, stress activates biochemical mechanisms in the body that lead to vasoconstriction of blood vessels due to the secretion of certain hormones, thus partially explaining the mechanism of AH development. Many studies have demonstrated an association between AH and risk factors that have a large influence on the development and progression of AH[8,9].

The goals of this study were: a) determine the deviation in BP values in newly-diagnosed, untreated, and inadequately treated patients with hypertension in comparison with normal values; b) emphasize the importance of screening for AH in emergency medicine in order to facilitate identification of newly-diagnosed cases and treating a larger number of patients.

Patients and Methods

The study was conducted at the Emergency Medical Clinic of the JZU Health Center Živinice between January 1 and April 30, 2022, and examined the prevalence of patients presenting with AH as well as cardiovascular risk factors impor-

uzorak od ukupno 160 ispitanika obaju spolova, starijih od 18 godina.

Prvu skupinu činilo je 40 ispitanika prijavljenih Službi hitne medicinske pomoći (SHMP) zbog AH-a. Drugu skupinu činilo je 40 ispitanika hipertoničara koji se ne liječe. U trećoj skupini bilo je također 40 ispitanika u kojih su slučajnim mjerenjem utvrđene visoke vrijednosti AT-a. Četvrta skupina bila je kontrolna grupa i činilo ju je 40 ispitanika koji su se pojavili zbog mogućih problema s povišenim vrijednostima AT-a, a tijekom pregleda u SHMP-u vrijednost AT-a je bila u referentnim vrijednostima (normotenzivni ispitanici).

Svi su podatci obrađeni metodama deskriptivne statistike, pri čemu su brojčani podatci prikazani odgovarajućim mjerama središnje tendencije i mjerama varijance, te jasno prikazani odgovarajućim tablicama i grafikonima. Za izračunavanje statističke značajnosti primijenjene su neparametarske metode i testovi: x^2-test uporabljen je za izračunavanje razlika unutar skupina, a Kruskal-Wallisov test za izračunavanje razlika između grupa uz x^2-test i, ako postoji statistički značajna razlika između skupina, provedeno je dodatno testiranje između skupina s pomoću Mann-Whitneyjeva U-testa. Za parametarske podatke izračunate su razlike između skupina primjenom jednosmjerne analize varijance (ANOVA), s naknadnim izračunom Tukeyjevog HD testa ako postoje razlike među skupinama, a primijenjen je Studentov „t"-test za zavisne uzorke. Statističke su hipoteze testirane na razini $\alpha = 0,05$, odnosno razlika između skupina u uzorku smatrana je značajnom ako je $p < 0,05$. Statistička obrada obavljena je uz podršku biomedicinskog aplikativnog softvera pod nazivom „MedCalc za Windows verzija 12.4.0", Copyright © 1993-2013, a uglavnom primjenom softvera „SPSS Statistics 17.0", Copyright © 1993-2007.

Rezultati

U istraživanje je ukupno bilo uključeno 160 ispitanika, od čega je muškaraca bilo 59 (36,9%), a žena 101 (63,1%). Ova razlika u učestalosti muških i ženskih ispitanika i statistički je značajna ($x^2 = 11,025$; $df = 1$; $p = 0,001$).

tant to the development of AH. Four groups were formed as a consecutive sample of a total of 160 participants of both sexes, older than 18 years of age.

The first group comprised 40 participants who were admitted to the Emergency Medicine Service (EMS) due to AH. The second group comprised 40 participants with hypertension who were receiving no treatment. The third group comprised 40 participants in whom incidental measurements determined high BP values. The fourth group were the controls, comprising 40 participants who presented at the clinic due to issues possibly related to high BP, but whose BP was within reference ranges during their examination at the EMS (normotensive participants).

All data were analyzed using descriptive statistical methods, with numerical data presented as measures of mean tendency and variance and clearly shown in the appropriate tables and figures. Statistical significance was calculated using non-parametric methods and tests: the x^2 test was used to calculate differences within groups, and the Kruskal-Wallis test was used to calculate differences between groups along with the x^2 test, and additional testing was performed with the Mann-Whitney U test if there was a statistically significant difference between the groups. For parametric data, difference between groups were calculated using single factor analysis of variance (ANOVA), with subsequent calculation with Tukey's HD test if there were differences between groups, and the Student t test was used for dependent samples. Statistical hypotheses were tested at the $\alpha=0.05$ level, i.e. the difference between groups was considered significant if $p<0.05$. Statistical analysis was performed with the support of biomedical application software under the name "MedCalc for Windows version 12.4.0", Copyright © 1993-2013, and mostly using the a "SPSS Statistics 17.0", Copyright © 1993-2007 software.

Results

The study included a total of 160 participants, of whom there were 59 men (36.9%) and 101 women (63.1%). This difference in the prevalence of male and female participants was also statistically significant ($x^2=11.025$; $df=1$; $p=0.001$).

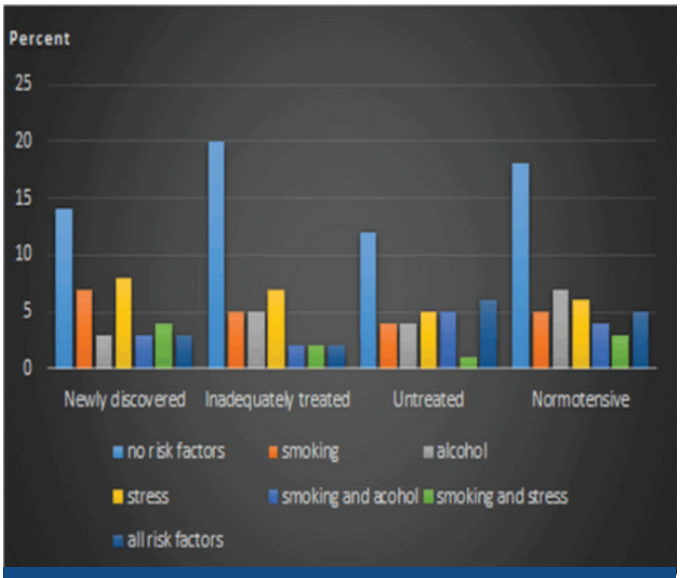

FIGURE 1. Risk factors for hypertension.

Računanjem razlika među skupinama utvrđena je statistički značajna razlika među promatranim skupinama, pri čemu najveći rang i najveću medijanu ima skupina neliječenih bolesnika, što govori u prilog tomu da su razlike u toj skupini najveće (x^2 = 13,11; df = 3; p = 0,004) (**Slika 1**).

Međutim, Kruskal-Wallisovim testom za ostale skupine ispitanika također je pokazana statistički značajna razlika među skupina (x^2 = 30,446; df = 2; p <0,001). Skupina neadekvatno liječenih ispitanika ima najveću srednju vrijednost ranga i najveću medijanu, što upućuje na to da je ova razlika najviše uvjetovana vrijednostima AT-a u toj skupini (**Tablica 1**).

Calculating the differences between groups found a statistically significant difference between the observed groups, with the highest range and the highest median in the group of untreated patients, indicating that the differences were the largest in this group (x^2=13.11; df=3; p=0.004) (**Figure 1**).

However, the Kruskal-Wallis for other analyzed patient groups also found a statistically significant difference between groups (x^2=30.446; df=2; p<0.001). The group of inadequately treated participants had the highest median range and highest median, indicating that this difference was mostly caused by BP values in this group (**Table 1**).

TABLE 1. Differences between individual groups in the blood pressure values.

	Mann-Whitney U	Significance level	Difference in favor of the group:
Newly discovered × Inadequately treated	Z=-4.92	p<0.001	Inadequately treated
Newly discovered × Untreated	Z=-2.88	p=0.004	Untreated
Inadequately treated × Untreated	Z=-3.79	p<0.001	Inadequately treated

Srednje vrijednosti sistoličkog i dijastoličkog tlaka na prijemu u pojedinim ispitivanim skupinama, kao i njihove najviše i najniže vrijednosti prikazane su u **tablici 2**. Testiranjem korelacije između indeksa tjelesne mase (ITM) i vrijednosti sistoličkoga tlaka utvrđeno je da postoji jednosmjerna korelacija (Pearsonov r = 0,136; p = 0,043).

Median values of systolic and diastolic pressure at admission in the study groups, as well as their highest and lowest values, are shown in **Table 2**. Correlation testing between body mass index (BMI) and systolic pressure values found that there was a unidirectional correlation (Pearson's r=0.136; p=0.043

TABLE 2. Values of systolic and diastolic blood pressure.

		N	Average value	Standard deviation	Lowest value	Highest value
Systolic pressure	Newly discovered	40	161.63	24.635	120	220
	Inadequately treated	40	193.88	27.885	125	290
	Untreated	40	172.75	15.189	150	220
	Normotensives patients	40	114.53	9.182	90	130
	Total	160	160.69	35.593	90	290
Diastolic pressure	Newly discovered	40	98.00	10.488	80	130
	Inadequately treated	40	107.00	12.547	80	140
	Untreated	40	105.18	9.223	100	140
	Normotensive patients	40	80.75	7.808	60	90
	Total	160	97.73	14.475	60	140

F (3.156) = 106.034; p<0.001; eta squared = 0.67 (systolic blood pressure)

F (3.156) = 55.434; p<0.001; eta squared = 0.51 (diastolic blood pressure)

Ne postoji korelacija (**Slika 2**) između vrijednosti ITM-a i životne dobi ispitanika (Pearsonov r = −0,98; p = 0,1).

There was no correlation (**Figure 2**) between BMI values and participant age (Pearson's r=-0.98; p=0.1).

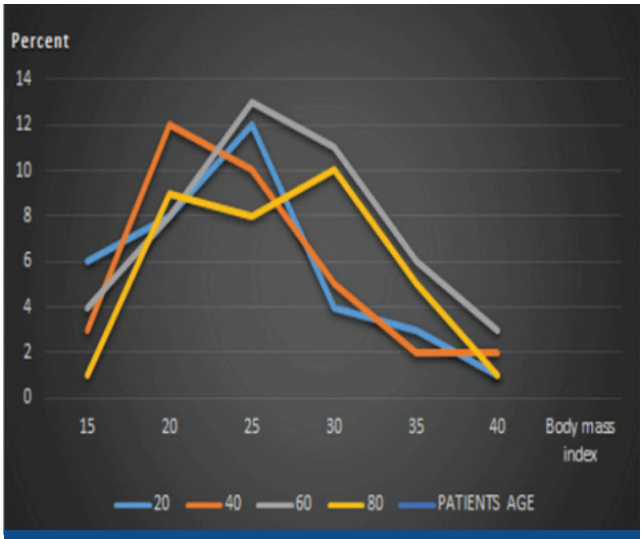

FIGURE 2. Ratio of age and body mass index.

Rasprava

Prema rezultatima ovog istraživanja, prosječna dob ispitanika bila je 49,7 godina. U istraživanju je bilo više žena s AH-om (63,1 %) i mnogo manje muškaraca (36,9 %). U ovom se istraživanju omjer žena i muškaraca u smislu incidencije AH-a ne slaže s istraživanjem provedenim u Francuskoj i u Ženevi, a slaže se s istraživanjem provedenim u Indiji, gdje muškarci češće imaju AH[10]. Istraživanje provedeno u Francuskoj navodi da je AH češći u dobnim skupinama od 55 do 74 godine. Muškarci obolijevaju više (47 %), a žene nešto manje (37 %). AH je najčešći kardiovaskularni poremećaj u europskim zemljama s visokim dohotkom, gdje se AH opaža u 20 do 50 % odrasle populacije[11].

Oras *i sur.* ističu da se u hitnoj medicinskoj pomoći AT mjeri gotovo svakom bolesniku, bez obzira na problem zbog kojeg se javlja na pregled, te da čak do trećine njih ima povišene vrijednosti tlaka (140/90 mmHg i više). Međutim, utvrđeno je da su odlasci u hitnu pomoć česti u stresnim situacijama, a u takvim uvjetima vrlo često se registrira povišen AT. Sukladno tomu, ustanovili su da je u takvim uvjetima povećana incidencija KV bolesti, prije svega infarkta miokarda. Zaključili su da je stres jedan od glavnih čimbenika rizika za razvoj AH-a i daljnji razvoj KV bolesti[12].

Istraživanje koje su proveli Shao *i sur.* procijenilo je čimbenike rizika u bolesnika s AH-om. Najvažniji rizici bili su pušenje i nedostatna tjelesna aktivnost. Kliničkom slikom u AH dominirale su glavobolja i mučnina, s promijenjenim psihičkim statusom u više od polovice bolesnika. Generalizirana tjelesna slabost pojavila se u 80% slučajeva AH-a. Takvi su čimbenici rizika povezani s lošim socioekonomskim uvjetima i visokom nepismenošću stanovništva[13].

Discussion

According to the results of the present study, average participant age was 49.7 years. The study had more women with AH (63.1%) and statistically significantly less men (36.9%). In the present study study, the ratio of women and men with regard to AH incidence was not in agreement with a study conducted in France and Geneva, but is in agreement to a study conducted in India, where men are more likely to have AH[10]. The study conducted in France reported that AH was more common in ages between 55 and 74. Incidence in men (47%) was somewhat higher than in women (37%). AH is the most common cardiovascular disorder in European high-income countries, where AH is observed in 20% to 50% of the adult population[11].

Oras et al. emphasized that BP is measured in almost all patients presenting to emergency medical care, regardless of the issue that the patient was admitted for, and that up to one third of these patients have elevated BP values (140/90 mmHg or more). However, it has been established that trips to the emergency room are common in stressful situations, which represent conditions in which elevated BP is often registered. Consequently, the authors determined that incidence of CV diseases is increased in these conditions, especially for myocardial infarction. They concluded that stress was one of the main risk factors for development of AH and further development of CV diseases[12].

A study conducted by Shao et al. estimated risk factors in patients with AH. The most important risk factors were smoking and insufficient levels of physical activity. The clinical picture of AH was dominated by headaches and nausea, with changes in mental status in more than half the patients. Generalized weakness was present in 80% of AH cases. Such risk factors were associated with poorer socioeconomic conditions and high levels of illiteracy in the population[13].

Arterijska hipertenzija, zajedno s pušenjem i visokom razinom lipida, glavni je uzrok infarkta miokarda i moždanih udara. Istraživanje provedeno u Engleskoj pokazalo je da je incidencija AH-a bila oko 37 %. Pušenje, muški spol, hiperkolesterolemija i dob bili su usko povezani s AH-om. Utvrđeno je da polovica ispitanika zna da ima AH, ali ne koristi antihipertenzivnu terapiju[14].

U svim promatranim skupinama stres i pušenje bili su vodeći čimbenici rizika u ispitanika s AH-om, a bili su prisutni (pojedinačno ili u kombinaciji) u 37,4 % ispitanika. Znatna povezanost između čimbenika rizika i AT-a uočena je u novodijagnosticiranih hipertenzivnih bolesnika. U kontrolnoj skupini (normotenzivna) u 18 (45,0 %) ispitanika nije bio prisutan nijedan od uočenih čimbenika rizika.

Ovo je istraživanje pokazalo da je prosječna vrijednost ITM-a u skupini novodijagnosticiranih hipertoničara bio 28,3, u neadekvatno liječenih 27,1 i u neliječenih 28,1, pa je srednji BMI u ispitivanim skupinama bio 27,0. Uočena je značajna razlika u vrijednostima ITM-a između promatranih skupina i normotenzivnih ispitanika. U promatranim su skupinama vrijednosti ITM-a bile nešto više u usporedbi s kontrolnom skupinom normotenzivnih ispitanika s vrijednostima ITM-a od 24,4, što se slaže s rezultatima istraživanja koje je Wang proveo u Americi[15].

Pozitivna obiteljska anamneza (nasljedna sklonost AH-u) bila je prisutna u više od polovice novodijagnosticiranih, neadekvatno liječenih i neliječenih hipertoničara obuhvaćenih ovim istraživanjem, dok je u kontrolnoj skupini (normotenzivnih) ispitanika samo 7 % njih imalo pozitivnu obiteljsku anamnezu. Studija koju su proveli Muiesan *i sur.* obuhvatila je kudikamo najviše sudionika (gotovo 702 milijuna). Njihova je studija uključila 15 velikih istraživanja u Americi, Kanadi, Australiji, Izraelu, Švedskoj, Iranu i Kongu, pri čemu je utvrđeno da pozitivna obiteljska anamneza AH-a postoji u 7 % bolesnika s AH-om, što je slično rezultatima ovog istraživanja[16].

U Velikoj Britaniji istraživanje koje su proveli Reynard *i sur.* od 45,2 % muškarca i 48,2 % žena otkrilo je visoku razinu kolesterola u krvi. Trećina ispitanika uzimala je hipolipemike. Istraživanja su pokazala da više od dvije trećine od 4 milijuna odraslih ima visoke vrijednosti kolesterola i AH[17].

U ovom istraživanju vrijednosti izmjerenog AT-a (prije terapije) u skupini novodijagnosticiranih i neliječenih hipertoničara kretale su se od umjerene AH (160 – 179 / 100 – 109 mmHg), dok su u skupini neadekvatno liječenih hipertoničara vrijednosti AT-a bile više (≥180 / 110 mmHg). Najviša vrijednost srednjega sistoličkog i dijastoličkoga tlaka bila je u skupini neadekvatno liječenih hipertoničara (194 / 107 mmHg). Ovo je u skladu s istraživanjem provedenim u Velikoj Britaniji, gdje je vrijednost AT-a u neadekvatno liječenih hipertoničara bila u prosjeku 175/107 mmHg[18].

Zaključak

Analizom četiriju skupina ispitanika istraživana je učestalost oboljelih od AH-a u ambulanti hitne medicinske pomoći te čimbenici važni za nastanak AH-a. Došlo se do sljedećih zaključaka: a) životna dob upućuje na to da se AH najčešće pojavljuje između 40. i 60. godine života; b) 47,8 % hipertoničara ima pozitivnu obiteljsku anamnezu (nasljednu sklonost za razvoj hipertenzije); c) najčešći čimbenici rizika koji utječu na nastanak i razvoj AH-a jesu pušenje i stres.

Arterial hypertension, together with smoking and high lipid levels, is the main cause of myocardial infarction and stroke. A study conducted in England showed that incidence of AH was approximately 37%. Smoking, male sex, hypercholesterolemia, and age were closely associated with AH. It was established that half of the participants knew they had AH but did not use antihypertensive therapy[14].

Stress and smoking were leading risk factors in all observed groups of participants with AH and were present (individually or in combination) in 37.4% participants. A significant association between risk factors and AP was observed in newly-diagnosed patients with hypertension. None of the studied risk factors were present in the (normotensive) control group of 18 (45.0%) participants.

This study showed that average BMI in the group of newly-diagnosed patients with hypertension was 28.3, 27.1 in the group of inadequately treated patients, and 28.1 in untreated patients, for a mean BMI of 27.0 in the study groups. A significant difference was observed in BMI values between the study groups and normotensive participants. BMI values in the study groups were somewhat higher in comparison with the control group of normotensive participants, who had a BMI of 24.4, which is in agreement with the study conducted by Wang in the USA[15].

In the present study, positive family history (hereditary predisposition to AH) was present in more than half of newly-diagnosed, inadequately treated, and untreated patients with hypertension. At the same time, only 7% of the control group (normotensive) participants had a positive family history. Muiesan et al. conducted a study with by far the largest number of participants, almost 702 million, and their study included 15 large studies in the USA, Canada, Australia, Israel, Sweden, Iran, and the Congo. It was established that positive family history for AH was present in 7% of patients with AH, which is similar to the results of this study[16].

In Great Britain, a study conducted by Reynard et al. comprising 45.2% men and 48.2% women found high levels of cholesterol in the blood. A third of the participants were using hypolipidemic. Studies have shown that more than two thirds of 4 million adults had high levels of cholesterol and AH[17].

In this study, measured BP values (before treatment) in the group of newly-diagnosed and untreated patients with hypertension were within ranges for moderate AH (160-179 / 100-109 mmHg), while BP values were higher in the group of inadequately treated patients with hypertension (≥180 / 110 mmHg). Highest median systolic and diastolic pressure values were observed in the group of inadequately treated patients with hypertension (193.88 / 107 mmHg). This agrees with a study conducted in Great Britain, were BP values in inadequately treated patients with hypertension were 175 / 107 mmHg on average[18].

Conclusion

Analysis of four groups of participants was used to examine the prevalence of AH in emergency medical care as well as risk factors for developing AH. The following conclusions were reached: a) patient age indicated that AH most commonly develops between 40 and 60 years of age; b) 47.8% patients with hypertension have a positive family history (hereditary predisposition for development of hypertension); c) the most common risk factors that affect the development and progression of AH are smoking and stress.

LITERATURE

1. Skoglund PH, Svensson P. Asking the patient or measuring blood pressure in the emergency department: which one is best? Curr Hypertens Rep. 2016 Feb;18:53. https://doi.org/10.1007/s11906-016-0659-0
2. Lonn E, Shaikholeslami R, Yi Q, Bosch J, Sullivan B, Tanser P, Magi A, et al. Effects of ramipril on left ventricular mass and function in cardiovascular patients with controlled blood pressure and with preserved left ventricular ejection fraction: a substudy of the Heart Outcomes Prevention Evaluation (HOPE) Trial. J Am Coll Cardiol. 2004 Jun;43(12):2200-6. https://doi.org/10.1016/j.jacc.2003.10.073
3. Elliott WJ. Systemic hypertension. Curr Probl Cardiol. 2007 Apr;32(4):201-59. https://doi.org/10.1016/j.cpcardiol.2007.01.002
4. Cutler JA, Sorlie PD, Wolz M, Thom T, Fields LE, Roccella EJ. Trends in hypertension prevalence, awareness, treatment, and control rates in United States adults between 1988-1994 and 1999-2004. Hypertension. 2008 Nov;52(5):818-27. https://doi.org/10.1161/HYPERTENSIONAHA.108.113357
5. Vallelonga F, Carbone F, Benedetto F, Airale L, Totaro S, Leone D, et al. Accuracy of a Symptom-Based Approach to Identify Hypertensive Emergencies in the Emergency Department. J Clin Med. 2020 Jul;9(7):2201. https://doi.org/10.3390/jcm9072201
6. Muiesan ML, Salvetti M, Rizzoni D, Paini A, Agabiti-Rosei C, Aggiusti C, et al. Resistant hypertension and target organ damage. Hypertens Res. 2013 Jun;36(6):485-91. https://doi.org/10.1038/hr.2013.30
7. Seeman T, Hamdani G, Mitsnefes M. Hypertensive crisis in children and adolescents. Pediatr Nephrol. 2019 Dec;34(12):2523-2537. https://doi.org/10.1007/s00467-018-4092-2
8. Rodriguez MA, Kumar SK, De Caro M. Hypertensive Crisis. Cardiol Rev. 2010 Mar;18:102-7. https://doi.org/10.1097/CRD.0b013e3181c307b7
9. Lazaridis AA, Sarafidis PA, Ruilope LM. Ambulatory Blood Pressure Monitoring in the Diagnosis, Prognosis, and Management of Resistant Hypertension: Still a Matter of our Resistance? Curr Hypertens Rep. 2015 Oct;17(10):78. https://doi.org/10.1007/s11906-015-0590-9
10. Mahmood S, Shah KU, Khan TM, Nawaz S, Rashid H, Baqar SWA, Kamran S. Non-pharmacological management of hypertension: in the light of current research. Ir J Med Sci. 2019 May;188(2):437-452. https://doi.org/10.1007/s11845-018-1889-8
11. Raji YR, Abiona T, Gureje O. Awareness of hypertension and its impact on blood pressure control among elderly nigerians: report from the Ibadan study of aging. Pan Afr Med J. 2017 Oct.;27:190. https://doi.org/10.11604/pamj.2017.27.190.11682
12. Oras P, Häbel H, Skoglund PH, Svensson P. Elevated blood pres sure in the emergency department: a risk factor for incident cardiovascular disease. Hypertension. 2020 Apr;75:229-236. https://doi.org/10.1161/HYPERTENSIONAHA.119.14002
13. Shao PJ, Sawe HR, Murray BL, Mfinanga JA, Mwafongo V, Runyon MS. Profile of patients with hypertensive urgency and emergency presenting to an urban emergency department of a tertiary referral hospital in Tanzania. BMC Cardiovasc Disord. 2018 Aug 2;18(1):158. https://doi.org/10.1186/s12872-018-0895-0
14. Ghazi L, Li F, Chen X, Simonov M, Yamamoto Y, Biswas A, et al. Blood pressure response to commonly administered antihypertensives for severe inpatient hypertension. PLoS One. 2022 Apr;17(4):e0265497. https://doi.org/10.1371/journal.pone.0265497
15. Wang C, Yuan Y, Zheng M, Pan A, Wang M, Zhao M, Li Y, Yao S, Chen S, Wu S, Xue H. Association of Age of Onset of Hypertension With Cardiovascular Diseases and Mortality. J Am Coll Cardiol. 2020 Jun 16;75(23):2921-2930. https://doi.org/10.1016/j.jacc.2020.04.038
16. Muiesan ML, Rosei EA, Borghi C, De Luca N, Ghiadoni L, Grassi G, et al; Italian Society of Hypertension. The UrgeRe (Urgenze Ipertensive: Un Progetto Educazionale Fondato Sulla Vita Reale, Hypertensive Urgencies: A Project in the Real World) Project. High Blood Press Cardiovasc Prev. 2021 Mar;28(2):151-157. https://doi.org/10.1007/s40292-021-00433-1
17. Reynard C, van den Berg P, Oliver G, Naguib MP, Sammut-Powell C, McMillan B, et al. The prognostic value of emergency department measured hypertension: A systematic review and meta-analysis. Acad Emerg Med. 2022 Mar;29(3):344-353.Acad Emerg Med. 2022 May;29:344-353. https://doi.org/10.1111/acem.14324
18. Astarita A, Covella M, Vallelonga F, Cesareo M, Totaro S, Ventre L, et al. Hypertensive emergencies and urgencies in emergency departments: a systematic review and meta-analysis. J Hypertens. 2020 Jul;38(7):1203-1210. https://doi.org/10.1097/HJH.0000000000002372