



## Čimbenici rizika nastanka kardiovaskularnih bolesti u policijskih djelatnika

## Risk factors for occurrence of cardiovascular diseases in police employees

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**SAŽETAK:** Policijski službenici, zbog izloženosti traumatskim situacijama i smjenskom radu, predstavljaju rizičnu skupinu radne populacije jer imaju povišenu učestalost kardiovaskularnih bolesti. Cilj rada je prikazati prisutnost pojedinih čimbenika rizika među djelatnicima policije te utvrditi postoje li razlike prema spolu. Organiziranom javnozdravstvenom akcijom prigodom Svjetskog dana srca 2009. godine istraženi su demografski podaci, vrijednosti arterijskog tlaka (AT) i glukoze u kapilarnoj krvi u 139 policijskih djelatnika. U više od trećine ispitanika registrirana je povišena vrijednost AT, a vrijednosti dijastoličkog tlaka bile su značajno više u osoba muškog spola. Izmjerene vrijednosti AT zahtijevaju daljnju kontrolu.

**KLJUČNE RIJEČI:** kardiovaskularne bolesti, čimbenici rizika, djelatnici policije, arterijski tlak

**SUMMARY:** Due to exposure to traumatic situations and shift work, police officers constitute a risk group within the working population since they show a higher frequency of cardiovascular diseases. The goal of the article is to show the presence of individual risk factors among police employees and determine whether there are any differences with regard to gender. In the public health action organized on occasion of the 2009 World Heart Day, demographic data, blood pressure (BP) values and glucose in capillary blood have been investigated in 139 police officers. In more than one third of examinees there was a higher BP registered and the values of diastolic pressure were significantly higher in male persons. The measured values of the BP require additional follow-ups.

**KEYWORDS:** cardiovascular diseases, risk factors, police employees, blood pressure

### Uvod

Svjetska kardiološka federacija, u suradnji s nacionalnim kardiološkim društvima, obilježila je Svjetski dan srca 2009. godine. Vodeća tema ove godine bilo je prepoznavanje i smanjenje čimbenika rizika za nastanak kardiovaskularnih bolesti (KVB) na radnom mjestu pod sloganom "Radi za srce"<sup>1</sup>. Prigodom obilježavanja u gradu Zagrebu<sup>2</sup> dogovorena je suradnja između Policijske uprave zagrebačke (PUZ), Poliklinike za prevenciju kardiovaskularnih bolesti i rehabilitaciju i Poliklinike za bolesti dišnog sustava o provođenju javnozdravstvene akcije detekcije čimbenika rizika za KVB te mjerenju plućne funkcije.

Rezultati dosadašnjih studija ističu policijske službenike kao izrazito rizičnu skupinu radne populacije, obzirom na povišenu učestalost manifestacija aterosklerotske bolesti srca, poremećaja prehrane, prijevremenih smrti, povećane sklonosti alkoholizmu, samoubojstvu, cirozi jetre, neoplazmama u probavnom sustavu<sup>3-5</sup>. Kao uzrok, između ostaloga, spominju se i izloženost stresnim traumatskim situacijama i smjenski rad.

Cilj ovog rada je prikazati prisutnost pojedinih čimbenika rizika za nastanak kardiovaskularnih bolesti među policijskim djelatnicima te utvrditi postoje li razlike koje bi ovisile o spolu.

### Metode

Djelatnici PUZ dragovoljno su uključeni u, unaprijed najavlvenu, javnozdravstvenu akciju detekcije pojedinih čimbenika rizika za nastanak KVB koja se odvijala u rad-

### Introduction

The World Cardiac Federation has in cooperation with national cardiac societies celebrated the 2009 World Heart Day. The main topic this year was the recognition and decrease in risk factors of cardiovascular diseases at workplace under the motto "Work with Heart"<sup>1</sup>. While celebrating it in the town of Zagreb<sup>2</sup>, the cooperation between the Zagreb Police Authorities, the Institute for Prevention of Cardiovascular Diseases and Rehabilitation and the Institute for Respiratory Diseases was agreed upon conducting the public health actions regarding the detection of risk factors for cardiovascular diseases and measurement of pulmonary function.

The results of the recent studies indicate that police officers are an extreme risk group in the working population considering an increased frequency of manifestations of atherosclerotic heart disease, food disorder, early death, increased alcoholism tendency, suicide, liver cirrhosis, neoplasm in digestion system<sup>3-5</sup>. The reason is, besides some other, the exposure to stress traumatic situations and shift work.

The goal of the article is to show the presence of individual risk factors for cardiovascular diseases among police employees and determine whether there are any differences with regard to gender.

### Methods

The employees of the Zagreb Police Authorities have voluntarily joined the previously announced public health action regarding the detection of individual risk factors for



nim prostorijama, u prijednevima. Rezultati mjerenja pulmonalne funkcije prikazani su u zasebnom članku<sup>6</sup>.

Po uzimanju demografskih podataka djelatnici Poliklinike za prevenciju kardiovaskularnih bolesti i rehabilitaciju, svim ispitanicima izmjerili su vrijednosti arterijskog tlaka (AT) i odredili vrijednost glukoze u krvi (GUK). Vrijednost AT je izmjerena digitalnim tlakomjerom *Omron M 10 IT* na lijevoj ruci, u jednom navratu. Glukoza je mjerena glukometrom *Medisense Optium Xceed* iz kapilarne krvi prsta lijeve ruke.

Dobivene vrijednosti opisane su metodama deskriptivne statistike, a za testiranje razlika prema spolu uporabljen je Student t-test. Analiza podataka je obavljena uporabom analitičkog sustava STATISTICA for Windows<sup>7</sup>.

the occurrence of cardiovascular diseases that was conducted in the premises during the morning hours. The results of the measurement of pulmonary function have been presented in a separate article<sup>6</sup>.

During the time of taking demographic data, the employees of the Institute for the Prevention of Cardiovascular Diseases and Rehabilitation, the blood pressure (BP) values were examined to all the examinees and the value of blood glucose was determined. The BP value was once measured with digital manometer *Omron M 10 IT* on the left arm. Glucose was measured with glucometer *Medisense Optium Xceed* from the capillary blood of the finger of the left hand.

The obtained values were described by using descriptive statistical methods and the Student t-test was used for testing the differences with regard to gender. The data ana-

Sex	Mean	Standard deviation	Minumum	Lower quartile (Q1)	Median	Upper quartile (Q3)	Maximum	P*
<b>Age (years)</b>								
male	41,4	7,5	26,0	36,5	42,5	47,0	58,0	<b>0,013</b>
female	44,9	8,1	26,0	38,0	44,0	52,0	64,0	
all	43,6	8,0	26,0	38,0	44,0	50,0	64,0	
<b>Blood glucose (mmol/L)</b>								
male	5,88	1,15	4,30	5,20	5,50	6,30	9,40	0,973
female	5,89	1,05	4,20	5,20	5,70	6,20	9,60	
all	5,89	1,08	4,20	5,20	5,60	6,30	9,60	
<b>Systolic blood pressure (mmHg)</b>								
male	140,0	13,8	120,0	130,5	137,0	150,0	179,0	0,162
female	135,5	20,6	103,0	120,0	130,0	147,0	204,0	
all	137,2	18,4	103,0	124,0	134,0	148,0	204,0	
<b>Diastolic blood pressure (mmHg)</b>								
male	93,6	9,3	77,0	87,0	92,0	102,0	113,0	<b>0,026</b>
female	89,1	12,4	50,0	82,0	87,0	95,0	126,0	
all	90,8	11,5	50,0	83,0	90,0	99,0	126,0	

\* P value for t-test

Table 1. Demographic data, blood pressure values and blood glucose values.

## Rezultati

Akciji je pristupilo 139 djelatnika PUZ-a i to 87 žena (62,6%) i 52 muškarca (37,4%). Prosječna životna dob žena bila je viša nego kod muškaraca ( $44,9 \pm 8,1$  za žene naspram  $41,4 \pm 7,5$  za muškarce;  $P=0,013$ ; **tablica 1**).

Nije registrirana statistički značajna razlika u vrijednosti GUK-a u ispitanika prema spolu ( $5,88 \pm 1,15$  za muškarce naspram  $5,89 \pm 1,05$  mmol/L za žene;  $P=0,973$ ). Također nije utvrđena značajna razlika u vrijednostima sistoličkog AT s obzirom na spol. Kod muškaraca je srednja vrijednost sistoličkog AT iznosila  $140,00 \pm 13,84$  mmHg (raspon 120-179 mmHg), u žena  $135,48 \pm 20,55$  mmHg (raspon 103-204 mmHg). Srednja vrijednost dijastoličkog AT bila je značajno viša u muškaraca nego u žena ( $93,56 \pm 9,29$  za muškarce naspram  $89,10 \pm 12,57$  mmHg za žene;  $P=0,026$ ).

## Diskusija

Ovaj rad donosi pregled podataka o vrijednostima AT i GUK-a u djelatnika PUZ koji su dragovoljno pristupili najavljenj javnozdravstvenoj akciji. Analizirajući dobivene

lysis was conducted by using the analytical system STATISTICA for Windows<sup>7</sup>.

## Results

139 employees of the Zagreb Police Authorities, namely, 87 women (62.6%) and 52 men (37.4%) were included in the action. The average age for women was higher than for men ( $44.9 \pm 8.1$  for women compared to  $41.4 \pm 7.5$  for men;  $P=0.013$ ; **table 1**).

The statistically significant difference in the value of blood glucose in examinees with regard to gender ( $5.88 \pm 1.15$  for men compared to  $5.89 \pm 1.05$  mmol/L for women;  $P=0.973$ ) was not registered. The significant difference in the values of the systolic BP with regard to sex was not determined. The mean value of systolic BP was  $140.00 \pm 13.84$  mmHg (ranging from 120 to 179 mmHg) for men, for women it was  $135.48 \pm 20.55$  mmHg (ranging from 103 to 204 mmHg). The mean value of the diastolic BP was much higher in men than in women ( $93.56 \pm 9.29$  for men compared to  $89.10 \pm 12.57$  mmHg for women;  $P=0.026$ ).



podatke, vidljivo je da je gotovo dvije trećine ispitanika bilo ženskog spola, što ne odgovara stvarnoj raspodjeli djelatnika prema spolu.

Iako su ispitanici bili obaviješteni o vremenu odvijanja akcije, većina ispitanika nije bila natašte. Srednja vrijednost GUK-a bila je uredna, a značajne razlike između ispitanika prema spolu nisu registrirane.

Srednja vrijednost AT za muškarce je iznosila 140/94 mmHg, a za žene 136/89 mmHg. Ukupno 27 žena (31%) i 21 muškarac (40%) imali su izmjerene vrijednosti AT više od 140/90 mmHg. Prema smjernicama za liječenje arterijske hipertenzije (AH) iz 2007. godine<sup>8</sup>, vrijednost AT 130-139/80-89 mmHg smatra se visoko normalnim, a 140-159/90-99 mmHg hipertenzijom 1. stupnja. *Jelaković i sur.*<sup>9</sup> u radu o učestalosti AH u Hrvatskoj iznijeli su podatak o srednjoj vrijednosti AT za muškarce i žene, 137/84 mmHg, odnosno 134/83 mmHg.

U ovom je ispitivanju vrijednost AT izmjerena u samo jednom navratu te nikako na temelju tog jednog mjerenja ne možemo govoriti o AH. Činjenica koju ipak ne možemo zanemariti jest, da je više od trećine (35%) svih ispitanika imalo povišenu vrijednost AT, što nameće potrebu daljnje kontrole.

## Zaključak

Povišena učestalost nastanka KVB u djelatnika policije dobro je poznata i opisana. U ovom ispitivanju utvrđene su povišene vrijednosti AT u trećine djelatnika PUZ koji su pristupili javnozdravstvenoj akciji, a vrijednosti dijas-toličkog AT više su u muškaraca nego u žena. Izmjerene vrijednosti AT zahtijevaju daljnju kontrolu.

Received: 16<sup>th</sup> Dec 2009

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## Discussion

This article provides an overview of data on BP values and values of blood glucose in employees of the Zagreb Police Authorities that voluntarily joined the previously announced public health action. The analysis of the obtained data reveals that almost two thirds of examinees were females, which does not equal the real distribution of employees with regard to gender.

Although the examinees were informed of the time of the action, the most of the examinees were not on an empty stomach. The mean value of the blood glucose was normal, and the significant differences between examinees with regard to gender were registered.

The mean BP value for men was 140/94 mmHg, and for women it was 136/89 mmHg. The total number of 27 women (31%) and 21 men (40%) had measured BP values above 140/90 mmHg. According to the guidelines for the treatment of hypertension from 2007<sup>8</sup>, the BP value of 130-139/80-89 mmHg is considered normal and the value of 140-159/90-99 mmHg is considered the first degree hypertension. *Jelaković et al.*<sup>9</sup> in the article on frequency of hypertension in Croatia disclosed the data on the mean BP values for men and women, 137/84 mmHg, or rather 134/83 mmHg.

In this examination, the BP value was measured only once and we can not speak about hypertension based on one measurement. The fact that cannot be ignored is that more than one third (35%) of all examinees had higher BP value which requires the necessity of taking some further steps.

## Conclusion

An increased frequency of occurrence of cardiovascular diseases in police officers is well known which has been described. This examination revealed higher BP values in one third of the Zagreb Police Authorities employees who joined the public health action and the value of the diastolic BP is higher in men than in women. The measured values of the BP require follow-up.