



HYPERTENSION And OTHER RISK FACTORS OF ATHEROSCLEROSIS IN THE CZECH POPULATION

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Objective

The leading causes of death in the developed countries are atherosclerotic diseases of the circulatory system. Hypertension (HT) is one of the most important risk factors of atherosclerosis (RFA) and is often associated with other RFA.

The main objective of the paper is to demonstrate prevalence of HT and other RFA in the two urban Czech populations.

Design and Methods

Total of 968 persons was examined in two preventive out patient departments of EuroMISE Centre (in small town Čáslav - Č, and in capital Prague - P). Of them, 412 were men (42.56 %, mean age 47.78 years) and 556 women (57.44 %, mean age 49.35 years) - see Figure 1. Basic characteristics of all women and of all men in the study are done in Table 1 and 2.

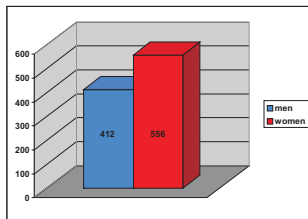


Figure 1: Study population

	Prague		Čáslav		p value
	Mean	SD	Mean	SD	
Age (years)	42.82	11.57	47.79	11.14	< 0.001
BMI	26.10	4.48	27.44	6.04	0.006
Waist (cm)	82.86	11.98	81.95	14.11	0.45
Hip (cm)	101.44	9.82	99.32	12.24	0.039
WHR	0.81	0.08	0.82	0.07	0.287
BP syst. (mm Hg)	133.93	24.71	131.66	21.46	0.275
BP diastol. (mm Hg)	84.34	11.42	82.52	11.2	0.078
Glykemia (mmol/l)	4.91	0.79	4.96	0.84	0.576
Uric acid (umol/l)	264.54	64.81	224.96	66.29	< 0.001
Total cholesterol (mmol/l)	5.66	1.06	5.78	1.26	0.374
HDL cholesterol (mmol/l)	1.7	0.31	1.73	0.47	0.509
LDL cholesterol (mmol/l)	3.39	0.92	3.43	1.05	0.745
Triglycerids (mmol/l)	1.37	0.68	1.43	0.84	0.528

Table 1: Women - basic characteristics

	Prague		Čáslav		p value
	Mean	SD	Mean	SD	
Age (years)	49.29	13.92	46.99	10.34	0.056
BMI	26.62	4.03	28.22	3.91	< 0.001
Waist (cm)	92.78	11.87	93.50	10.41	0.529
Hip (cm)	100.44	7.49	98.44	8.45	0.096
WHR	0.92	0.07	0.95	0.07	< 0.001
BP syst. (mm Hg)	134.25	15.21	138.56	17.39	0.019
BP diastol. (mm Hg)	85.6	9.65	87.89	10.84	0.047
Glykemia (mmol/l)	5.09	0.75	5.17	1.41	0.836
Uric acid (umol/l)	343.47	71.85	308.71	74.08	< 0.001
Total cholesterol (mmol/l)	5.35	0.90	5.90	1.17	< 0.001
HDL cholesterol (mmol/l)	1.49	0.35	1.44	0.41	0.294
LDL cholesterol (mmol/l)	3.14	0.66	3.6	1.00	< 0.001
Triglycerids (mmol/l)	1.74	1.84	1.96	1.29	0.233

Table 2: Men - basic characteristics

The hypertension was defined as blood pressure 140 and/or 90 mm Hg (130 and/or 85 mm Hg at patients with diabetes mellitus and/or blood sugar level > 6 mmol/l) or history of hypertension regardless actual value of blood pressure. According to this definition, there were 401 hypertensive persons (H+, 44.7 % in this population) - see Figure 2. Mean values of blood pressure in hypertensive women and men - see Table 3.

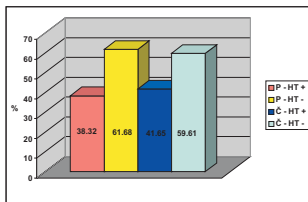


Figure 2: Hypertension in the study

	HT +		HT -		p value
	Mean	SD	Mean	SD	
Women					
Prague					
BP syst. (mm Hg)	155.17	22.53	119.54	11.18	< 0.001
diastol. (mm Hg)	93.78	9.47	79.13	7.18	< 0.001
Čáslav					
BP syst. (mm Hg)	149.52	19.75	120.05	12.15	< 0.001
diastol. (mm Hg)	96.93	9.73	77.92	8.36	< 0.001
Men					
Prague					
BP syst. (mm Hg)	143.38	14.66	123.63	7.95	< 0.001
diastol. (mm Hg)	90.95	8.98	81.64	6.26	< 0.001
Čáslav					
BP syst. (mm Hg)	148.01	16.60	126.64	9.49	< 0.001
diastol. (mm Hg)	94.33	9.74	81.61	6.68	< 0.001

Table 3: Mean values of blood pressure

Statistical analysis

Statistical programme R, version 1.7.1 was used. Mean and standard deviation (SD) are mentioned in the tables. The comparison of the groups of both towns was done by two-side test. The value of $p < 0.05$ means statistical significance.

Results

Most of hypertensive persons have higher education (46.80 %), 16.2 % are smokers and 45.69 % are without any physical activity. There are significant differences ($p < 0.001$) between hypertensive and non-hypertensive persons of both gender in age, BMI, circumference of waist and hip and WHR and in the triglyceride concentration and blood sugar level, in women in addition in the level of total, HDL and LDL cholesterol, respectively. Hypertensive persons are older, with higher values of BMI, circumference of waist and hip and WHR and in the triglyceride concentration and blood sugar level, women with hypertension have extra higher level of total and LDL cholesterol and lower level of HDL cholesterol - see Table 4 - 7.

	HT +		HT -		p value
	Mean	SD	Mean	SD	
Age (years)	58.65	9.79	49.72	11.1	< 0.001
BMI	28.43	4.39	24.74	3.96	< 0.001
Waist (cm)	90.86	11.51	78.32	9.57	< 0.001
Hip (cm)	106.58	9.65	98.57	8.67	< 0.001
WHR	0.95	0.09	0.79	0.06	< 0.001
HDL cholesterol (mmol/l)	1.62	0.31	1.74	0.3	0.046
LDL cholesterol (mmol/l)	3.89	0.76	3.4	1.01	0.019
Triglycerids (mmol/l)	1.45	0.77	1.33	0.62	0.388
Uric acid (mmol/l)	292.56	62.22	244.3	47.1	< 0.001
Glykemia (mmol/l)	5.03	0.77	4.83	0.79	0.2

Table 4: Prague - women - difference between hypertensive (HT+) and non-hypertensive (HT-) people

	HT +		HT -		p value
	Mean	SD	Mean	SD	
Age (years)	51.89	14.25	47.99	13.91	0.074
BMI	27.84	4.17	25.68	3.67	0.001
Waist (cm)	95.2	12.53	90.88	10.64	0.03
Hip (cm)	101.57	8.39	99.56	6.63	0.115
WHR	0.94	0.08	0.91	0.06	0.055
HDL cholesterol (mmol/l)	1.39	0.34	1.61	0.33	0.009
LDL cholesterol (mmol/l)	3.07	0.6	3.21	0.71	0.297
Triglycerids (mmol/l)	2.01	2.18	1.43	0.61	0.142
Uric acid (mmol/l)	391.97	76.89	328.97	66.26	0.049
Glykemia (mmol/l)	5.21	0.74	4.96	0.76	0.154

Table 5: Prague - men - difference between hypertensive (HT+) and non-hypertensive (HT-) people

	HT +		HT -		p value
	Mean	SD	Mean	SD	
Age (years)	53.81	9.73	43.34	10.07	< 0.001
BMI	30.73	6.55	25.42	4.7	< 0.001
Waist (cm)	89.92	14.42	77.21	11.59	< 0.001
Hip (cm)	105.42	13.42	95.69	9.87	< 0.001
WHR	0.85	0.07	0.8	0.06	< 0.001
BP syst. (mm Hg)	148.52	19.75	120.05	12.15	< 0.001
BP diastol. (mm Hg)	90.83	9.73	77.92	8.36	< 0.001
Heart frequency/min.	76.21	11.59	73.18	11.96	0.023
Total cholesterol (mmol/l)	6.22	1.52	5.52	1.03	< 0.001
HDL cholesterol (mmol/l)	1.6	0.48	1.8	0.45	< 0.001
LDL cholesterol (mmol/l)	3.86	1.06	3.19	0.97	< 0.001
Triglycerids (mmol/l)	1.65	0.86	1.3	0.8	0.001
Uric acid (mmol/l)	253.02	62.15	212.98	54.45	0.001
Glykemia (mmol/l)	5.31	1.07	4.77	0.8	< 0.001

Table 6: Čáslav - women - difference between hypertensive (HT+) and non-hypertensive (HT-) people

	HT +		HT -		p value
	Mean	SD	Mean	SD	
Age (years)	49.79	9.39	44.42	10.08	< 0.001
BMI	29.76	4.21	26.78	2.97	< 0.001
Waist (cm)	97.72	10.37	89.48	8.76	< 0.001
Hip (cm)	100.44	6.44	96.52	8.97	< 0.001
Waist (cm)	97.72	10.37	89.48	8.76	< 0.001
Hip (cm)	100.44	6.44	96.52	8.97	< 0.001
HDL cholesterol (mmol/l)	1.45	0.41	1.43	0.42	0.345
LDL cholesterol (mmol/l)	3.55	1.04	3.05	0.97	0.43
Triglycerids (mmol/l)	2.13	1.27	1.81	1.19	0.068
Uric acid (mmol/l)	322.15	79.49	293.16	64.59	0.04
Glykemia (mmol/l)	5.51	1.79	4.88	0.83	0.001

Table 7: Čáslav - men - difference between hypertensive (HT+) and non-hypertensive (HT-) people

The differences between hypertensive and non-hypertensive people in Prague and in Čáslav in socio-economic factors (education) and in factors of life style (physical activity in leisure time and smoking status) are given in Tables 8 - 10.

	P: HT+	P: HT-	Č: HT+	Č: HT-
Basic (%)	5.1	4.6	44.98	30.43
Secondary (%)	56.72	50.49	42.17	56.81
University (%)	26.07	40.10	12.86	12.75

Table 8: Education

	P: HT+	P: HT-	Č: HT+	Č: HT-
None (%)	18.52	22.89	60.83	51.06
Mid (%)	47.41	43.78	27.08	37.76
Moderate and high (%)	34.07	33.33	12.08	11.18

Table 9: Physical activity at leisure time

	P: HT+	P: HT-	Č: HT+	Č: HT-
Ex-smoker (%)	24.06	13.17	12.50	5.25
Smoker (%)	15.04	17.07	16.94	31.20
Non-smoker (%)	60.90	69.76	70.56	63.56

Table 10: Smoking status

In Prague, percentage in groups according to the education is similar in hypertensive and in non-hypertensive people (p value = 0.29). In Čáslav, the difference is namely in basic education, 44.98 % in hypertensive and 30.43 % in non-hypertensive people, respectively (p value < 0.001).

In Prague, there are any differences in percentage in groups according to the physical activity in the leisure time. In Čáslav, more than half of people is without any physical activity in the leisure time with statistical difference between hypertensive and non-hypertensive people (p value = 0.026).

According to the smoking status, there are significant differences in Prague and in Čáslav among tree groups (smoker, non-smoker, ex-smoker, p value < 0.001 in Čáslav and p value = 0.036 in Prague). In Prague, more ex-smokers are in hypertensive than in non-hypertensive people (24 % and 13 %, respectively). In Čáslav, in hypertensive people are less smokers than in non-hypertensive people (17 % and 31 %, respectively).

Conclusion

In examined Czech population is very high prevalence of HT, and hypertensive people have significantly worse total risk profile than non-hypertensive people. More intensive detection and more intensive treatment of these factors starting with changes of life style are necessary in the Czech population to diminish cardiovascular morbidity and mortality in the Czech Republic.

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