PREVALENCE OF HYPERTENSION WITHIN THE METABOLIC SYNDROME

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INTRODUCTION

As a result of present lifestyle (absence of physical activity, increased intake of calories, etc.) Is elevated number of persons with impaired glucose tolerance, cardiometabolic diseases, diabetes mellitus, obesity. According the estimation, worldwide 20 - 25 % population suffers from metabolic syndrome (MS). In this population, all cause mortality is two times higher and risk of cardiovascular event is tree times higher than in persons without metabolic syndrome. Prevalence of MS is growing to an epidemic in the developed countries.

MS as a complex of risk factors accelerates atherosclerosis more than individual risk factors. Intervention of these factors is more complicate and has to be complex. In this time, diagnosis of the MS is made namely on two definitions - NCEP-ATPIII (2001)[1] and IDF (2003)[2] - see ***Table 1.***

	NCEP-ATP III (2001)	IDF (2005)
Blood sugar – mmol/l	6.1	5.6 (or dg of DM 2. type)
Waist circumference – cm	102/88 (m/w)	94/80 (m/w)
Triglycerides – mmol/l	1.7	1.7 (or treated)
HDL cholesterol – mmol/l	< 1/1.3 (m/w)	< 0.9/1.0 (m/w) (or treated)
Blood pressure – mm Hg	130/85	130 syst. or 85 diastol. (or treated)
Diagnosis of MS	**3 factors from 5**	**Waist circumf. + 2 other factors**

Table 1: Definition of metabolic syndrome

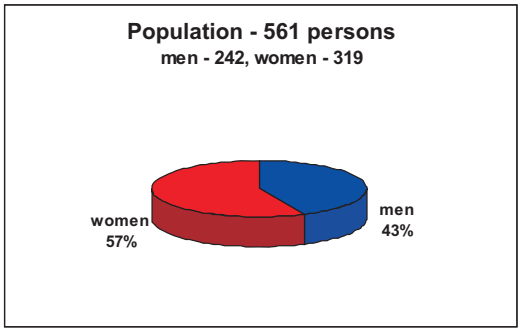
OBSERVATION

In Centre of Biomedical Informatics (CBI) operate two out-patient clinics (in Institute of Computer Science, Prague, and in Municipal Hospital, Caslav) specialized on examination and consultation for prevention of atherosclerotic cardiovascular diseases. Participation is voluntary, no randomisation is made. Data collection according to data model serves to an interdisciplinary research and scientific work in EuroMISE centre (European centre of Medical Informatics, Statistics and Epidemiology). The analysis of data is made anonymously with an informed consent of examined persons.

RESULTS

The aim of this presentation is to demonstrate high prevalence of MS and its individual factors in non-selected population of 561 persons without manifest cardiovascular diseases (242 men = 43.14 % and 319 women = 56.86 %, mean age 50.8 ± 9.48 years and 54.5 ± 9.22 years, respectively) - see ***Figure 1***. The basic characteristics of men and of women are given in ***Table 2*** and ***Table 3***.

Figure 1.



	median	mean	sd
Age (years)	50.76	50.80	9.48
Waist circumference (cm)	101.5	103.71	8.54
Systolic BP (mm Hg)	145.00	146.15	16.66
Diastolic BP (mm Hg)	90.00	93.10	9.30
Blood sugar (mmol/l)	5.36	5.62	1.68
HDL cholesterol (mmol/l)	1.29	1.36	0.40
Triglycerides (mmol/l)	1.90	2.26	1.38

Table 2: Men - factors of metabolic syndrome
(sd - standard deviation)

	median	mean	sd
Age (years)	55.44	54.50	9.22
Waist circumference (cm)	93.00	95.10	12.30
Systolic BP (mm Hg)	15.00	150.00	21.10
Diastolic BP (mm Hg)	90.00	90.40	9.93
Blood sugar (mmol/l)	5.20	5.40	1.05
HDL cholesterol (mmol/l)	1.20	1.51	0.39
Triglycerides (mmol/l)	1.71	1.94	0.99

Table 3: Women - factors of metabolic syndrome
(sd - standard deviation)

According to the IDF definition of the MS the prevalence of MS in total population was doubled compared to its NCEP-ATPIII definition (32.26 % and 14.90 %,respectively), without significant difference between men and women (in men - 14.86 % and 33.88 %, and in women - 14.94 % and 31.03 %, respectively) - see ***Figure 2***.

Among factors of MS, the most frequent was hypertension - see ***Table 4***, in the group of hypertensive persons, metabolic syndrome was detected statistically more frequently ($p < 0,001$) - see ***Figure 3***.

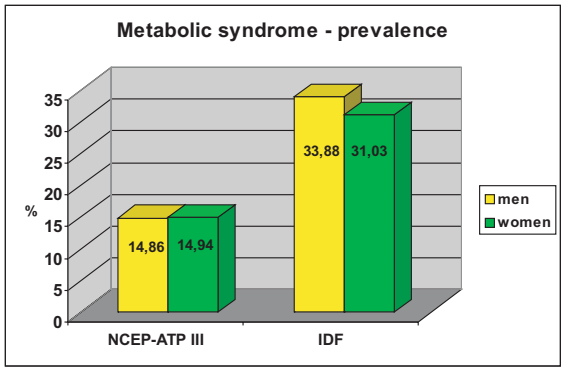


Figure 2.

	NCEP-ATP III		IDF	
	women	*men*	*women*	*men*
Hypertension	38.72	58.63	63.32	83.47
Waist circumference	29.27	17.67	48.28	45.45
Triglycerides	22.87	40.16	45.77	59.50
HDL cholesterol	15.24	9.64	4.08	4.55
Blood sugar	6.4	11.24	19.12	19.01

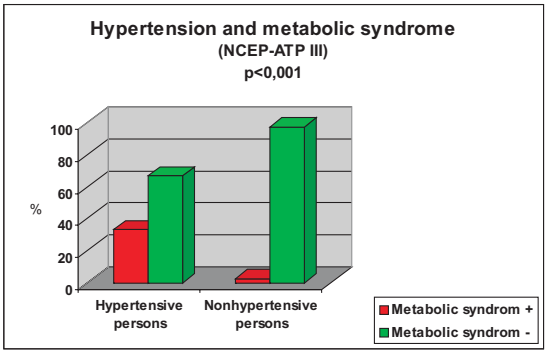
Table 4: Prevalence of particular risk factors within the metabolic syndrome

The number of factors within the metabolic syndrome is presented in ***Figure 4***.

The most often combinations were as follow:

- **tree factors** - waist circumference + hypertension + triglycerides (NCEP and IDF too)
- **four factors** - waist circumference + hypertension + triglycerides + HDL cholesterol (NCEP) and waist circumference + hypertension + triglycerides + blood sugar (IDF), respectively.

Figure 3.



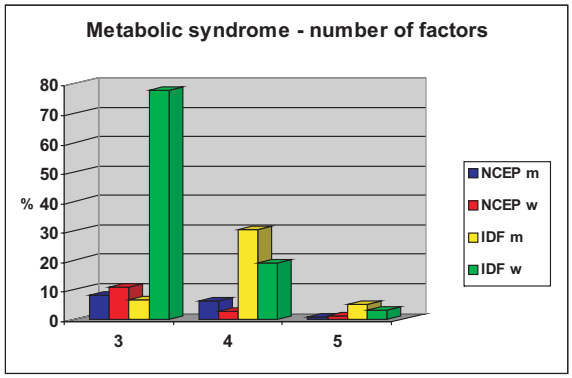


Figure 4.

CONCLUSION

Neither worldwide nor in the Czech Republic, the prevention of atherosclerotic cardiovascular diseases is satisfactory.

1. In non-randomized middle-aged voluntary population without manifest cardiovascular diseases was detected ***very high prevalence of metabolic syndrome***.
2. In accordance with different definition (NCEP-ATP III and IDF, respectively), ***prevalence of metabolic syndrome was more than doubled*** - from 14,90 % to 32,26 %.
3. This high prevalence of metabolic syndrome is created by ***high prevalence of individual factors***, namely hypertension, obesity and elevation of triglycerides.

[1]NCEP ATP III JAMA 2001, 285, 2486-2497
[2]IDF www.idf.org

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