



METABOLIC SYNDROME IN THE CZECH POPULATION

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INTRODUCTION

The metabolic syndrome as a complex of risk factors deteriorates atherosclerosis more than individual risk factors. Intervention of this sum of factors is more complicated and has to be complex. The result of present lifestyle (absence of physical activity, increased intake of calories, and etc.) is a higher number of persons with an impaired glucose tolerance, cardiometabolic diseases, diabetes mellitus, and obesity. According to the estimation, 20 - 25 % of the population worldwide suffers from the metabolic syndrome (MS). In this population, all causes mortality is two times higher and the risk of cardiovascular events is three times higher than in persons without MS. Prevalence of MS has been growing not only in the developed countries and results in an epidemic.

OBSERVATION

The aim of this presentation is to demonstrate high prevalence of MS in the non-selected population without manifest cardiovascular diseases (CVD) examined in the **Centre of Biomedical Informatics (CBI)** in two primary preventive out-patient departments placed in the northern part of the capital Prague (Institute of Computer Science, AS, CR) and in the regional hospital in the eastern Bohemia (Municipal Hospital in Caslav). Both departments are specialized on examinations and consultations for the prevention of atherosclerotic CVD. People come voluntarily, randomisation is not made. Data collection according to the minimal data model serves to interdisciplinary research and scientific work in the **EuroMISE centre (European Centre of Medical Informatics, Statistics and Epidemiology)**. The examined persons sign the informed consent, analysis of data is made anonymous.

METHODS

The diagnosis of MS was evaluated according to two definitions of the MS - NCEP - ATP III - 2001 (JAMA2001, 285, 2486-2497) and IDF - 2003 (www.idf.org) - see **Table 1**:

	NCEP-ATP III (2001)	IDF (2003)
Waist circumference - cm	102/88 (m/w)	≥ 94/80 (m/w)
Blood pressure - mm Hg	≥ 130/85	≥ 130 syst. or ≥ 85 diastol. (or pharmacoth)
Blood sugar - mmol/l	≥ 6.1	≥ 5.6 (or dg of type 2 diabetes)
HDL cholesterol - mmol/l	≤ 1/1.3 (m/w)	≤ 0.9/1.0 (m/w) (or pharmacoth)
Triglycerides - mmol/l	≥ 1.7	≥ 1.7 (or pharmacoth)
Diagnosis of MS	3 factors from 5	Waist circumf. + 2 other factors

Table 1: Definition of metabolic syndrome

The structure of the non-selected population of 1118 persons is given in **Figure 1**. In **Table 2** and **Table 3** there are given the basic characteristics of the population. In the left part of the tables there are factors that MS is consisted from, in the right part there are other characteristics.

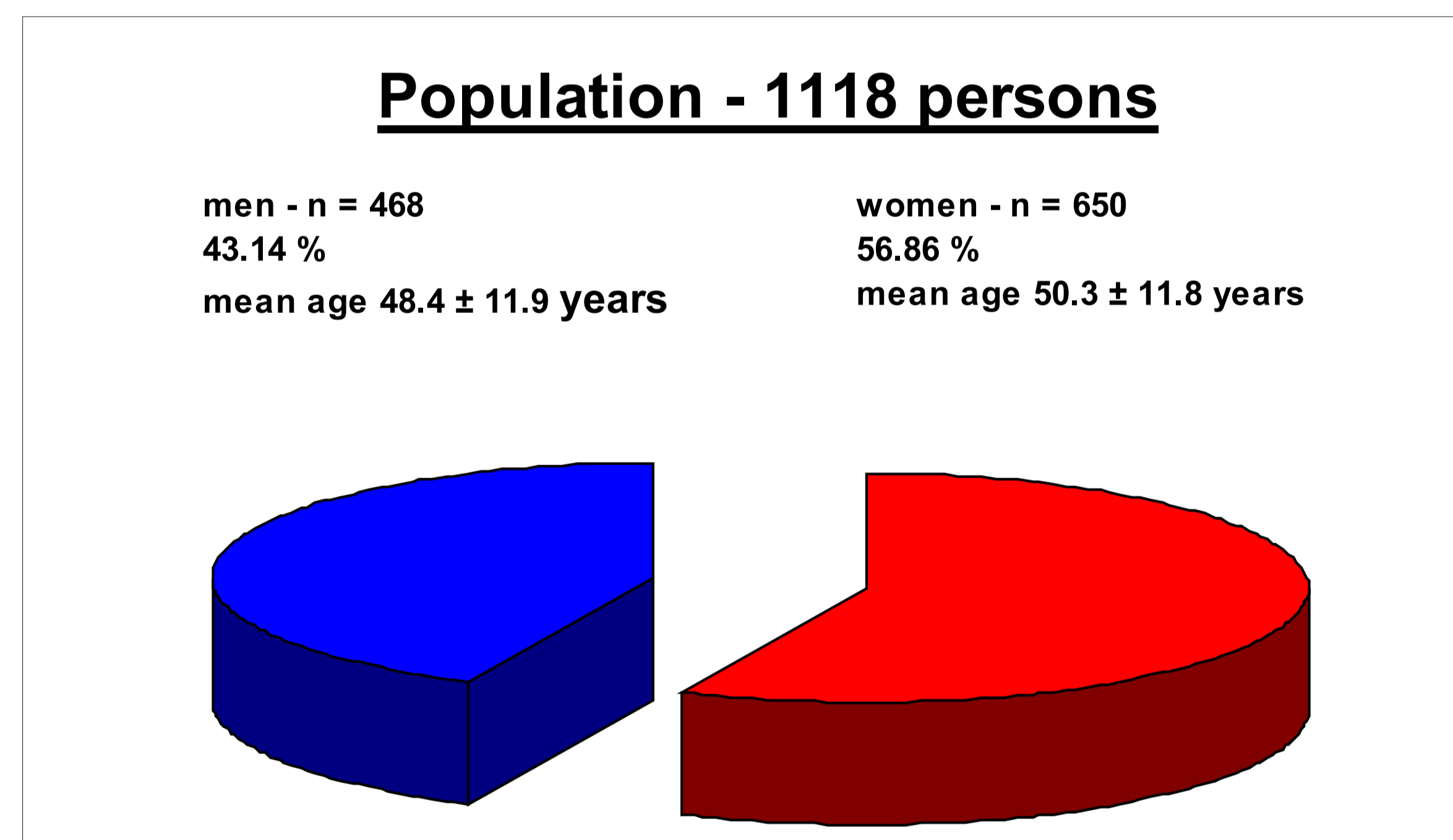


Figure 1.

	Mean	SD	Mean	SD
Waist (cm)	93.96	11.15	Age (years)	48.38
BP syst. (mm Hg)	136.94	16.74	BMI	27.80
BP diastol. (mm Hg)	87.39	10.44	WHR	0.94
Blood sugar (mmol/l)	5.15	1.21	Total chol. (mmol/l)	5.69
HDL chol. (mmol/l)	1.43	0.38	LDL chol. (mmol/l)	3.52
Triglycerides (mmol/l)	1.83	1.31	Uric acid (μmol/l)	323.72
				74.26

Table 2: Characteristics of the whole population - men

	Mean	SD	Mean	SD
Waist (cm)	82.66	13.25	Age (years)	50.33
BP syst. (mm Hg)	133.29	21.88	BMI	26.95
BP diastol. (mm Hg)	83.96	11.15	WHR	0.82
Blood sugar (mmol/l)	4.93	0.92	Total chol. (mmol/l)	5.73
HDL chol. (mmol/l)	1.71	0.43	LDL chol. (mmol/l)	3.47
Triglycerides (mmol/l)	1.38	0.76	Uric acid (μmol/l)	239.68
				67.15

Table 3: Characteristics of the whole population - women

As far as lifestyle factors are concerned, there are 22 % of men-smokers and 16 % of women-smokers in this population, 47 % of men and 39 % of women are physically inactive.

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RESULTS

Prevalence of risk factors that constitute MS in the whole population which is described above was very high - see **Table 4**. According to the IDF definition, the prevalence of MS was as well double as in the comparison with the NCEP-ATP III definition, without significant difference between men and women and without significant difference between two participant regions. MS was diagnosed according to NCEP-ATP III in 147 persons of 906 persons with all factors in database (i.e. in 16.22 % persons), and according to IDF in 267 persons of 810 persons with all factors in database (i.e. in 32.81 % persons) - see **Table 5** and **Figure 2**. The number of risk factors in the population with MS - see **Figure 3**. Among factors of MS, hypertension was the most frequent - see **Table 6**.

	NCEP-ATP III men	NCEP-ATP III women	IDF men	IDF women
Waist	23.0	31.6	32.0	51.3
HT	55.0	41.8	80.1	64.0
Blood sugar	11.1	5.1	23.0	18.6
HDL chol.	10.7	16.2	13.0	17.5
Triglycerides	41.1	23.0	41.8	24.1

Table 4: Prevalence of risk factors of metabolic syndrome in the whole population (% of persons)

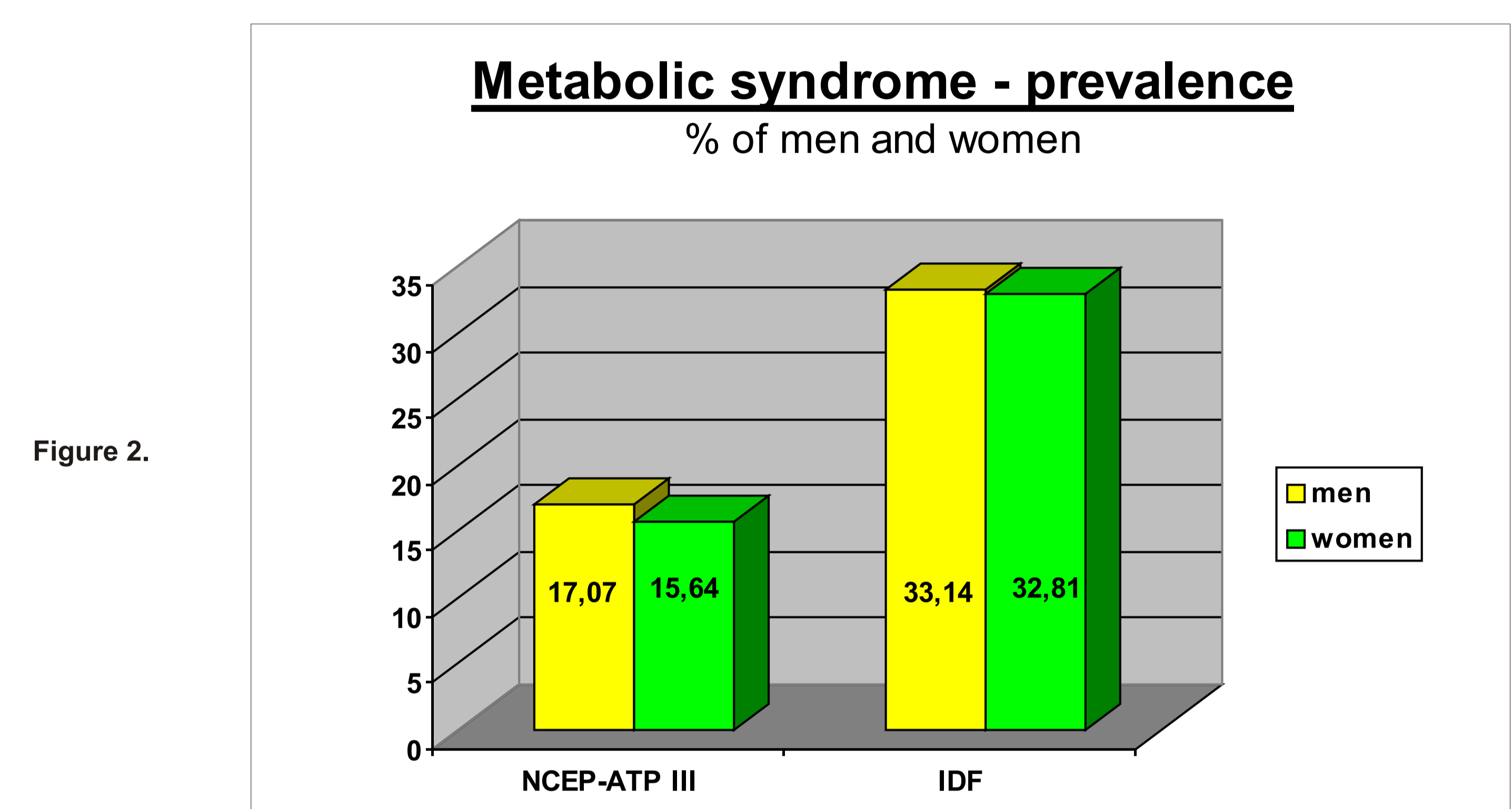


Figure 2.

	NCEP-ATP III n/%	IDF n/%
men	63 / 17.7	118 / 33.15
women	84 / 15.64	149 / 32.82
total	147 / 16.22	267 / 32.96

Table 5: Prevalence of the metabolic syndrome

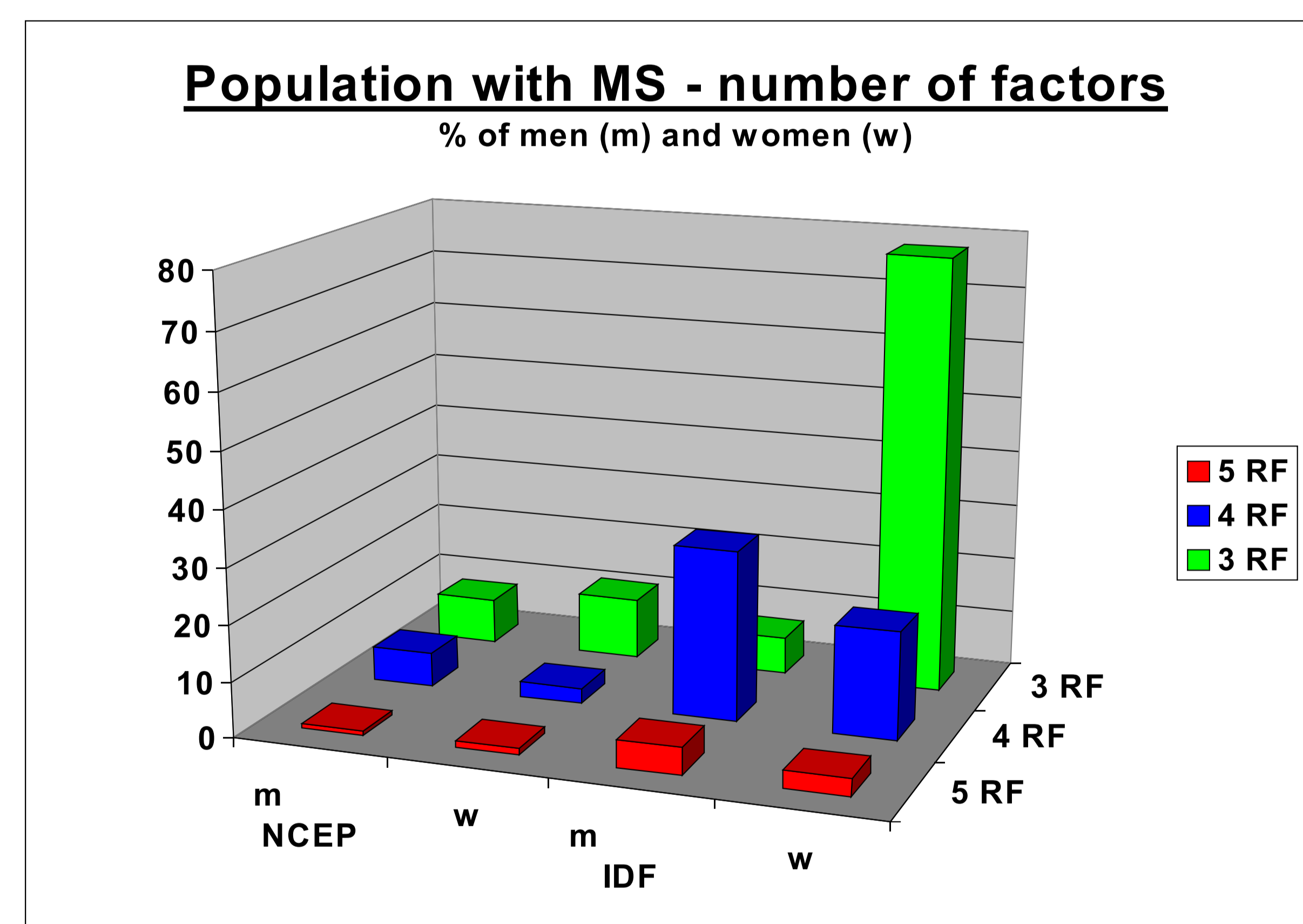


Figure 3.

	NCEP-ATP III men	NCEP-ATP III women	IDF men	IDF women
HT	88.7	84.3	97.5	95.3
Waist	82.2	87.6	100.0	100.0
Blood sugar	41.7	22.1	49.1	44.6
HDL chol.	44.3	67.7	28.1	49.0
Triglycerides	92.1	75.0	78.4	61.1

Table 6: Prevalence of particular risk factors of metabolic syndrome in the population with MS (% of persons)

CONCLUSIONS

- 1 **Very high prevalence of the metabolic syndrome**, even according to moderate definition (NCEP - ATP II), was detected in the non-randomized middle-aged voluntary population without manifest cardiovascular diseases.
- 2 In accordance with different definitions (NCEP-ATP III and IDF, respectively), **prevalence of the metabolic syndrome in IDF was more than doubled** - 32.26 % versus 14.90%.
- 3 This high prevalence of the metabolic syndrome is done by **high prevalence of individual factors**, particularly hypertension, obesity, and increased triglycerides.
- 4 Neither worldwide nor in the Czech Republic, the situation in the prevention of cardiovascular diseases is satisfactory. The high prevalence of metabolic syndrome in the Czech population may have a profound consequence for the economic and social well being of the Czech population.
- 5 All factors of metabolic syndrome are possible to prevent mainly with lifestyle changes. But for the population, this fact is acceptable only with difficulty.