Metabolic Syndrome Definitions In Relation To Intima Media Thickness And Insulin Senstivity In Healthy Adult Men And Women. The RISC Study



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Introduction

- The metabolic syndrome (MS) refers to the clustering of risk factors for cardiovascular disease and type 2 diabetes
- Several alternative definitions have been proposed for use in research and clinical practice
- Obesity and insulin resistance have been considered as the main underlying causes

Objective

To compare subjects with and without the metabolic syndrome according to several proposed definitions with respect to:

- Insulin sensitivity by euglycemic hyperinsulinaemic clamp
- Level of atherosclerosis by intima media thickness (IMT)

Population and Methods

- The Relationship between Insulin Sensitivity and Cardiovascular disease (RISC) Study recruited 479 men and 625 women in 18 European centers (Pisa, London, Amsterdam, Newcastle, Lyon, Odense, Dublin, Perugia, Geneva, Frankfurt, Malmö, Rome, Glasgow, Vienna, Madrid, Belgrade, Athens, Kuopio) in 2002–2004
- Inclusion criteria were: age 30–60, no symptomatic cardiovascular disease, blood pressure <140/90 mmHg, total cholesterol <7.8 mmol/L, triglycerides <4.6 mmol/L, and glucose (fasting/2 hours after oral gluocse tolerance test) <7.0/11.1 mmol/L
- A euglycaemic hyperinsulinaemic (40 mU.min⁻¹.m⁻²) clamp was used to measure insulin sensitivity (M value mg.min⁻¹.kg_{ffm}⁻¹)
- The IMT of the carotid artery was measured from ultrasound recordings by a single operator at the near and far wall of the left common carotid artery, and mean IMT (mm) was calculated
- Blood samples were assayed in central laboratories
- MS definitions were from the International Diabetes Federation (IDF), the National Cholesterol Education Program (NCEP), the European group for the Study of Insulin Resistance (EGIR), and the World Health Organisation WHO). For the WHO definition, we used 2 alternatives, using either fasting insulin (WHO-Ins) or clamp-derived insulin sensitivity (WHO-M)

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n	Women	
MS	no MS	MS
45 ± 8	44 ± 8	46 ± 8
103 ± 7	77 ± 10	93 ± 10
124 ± 10	112 ± 12	118 ± 11
1.1 ± 0.2	1.7 ± 0.3	1.3 ± 0.3
1.8 ± 0.8	0.8 ± 0.3	1.3 ± 0.6
5.5 ± 0.6	4.8 ± 0.5	5.3 ± 0.6
6.2 ± 1.5	5.6 ± 1.4	6.4 ± 1.7

Conclusions

IMT by any definition

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In a healthy population MS was associated with insulin resistance and increased