METABOLIC SYNDROME IN HUMAN MEDICINE: DEFINITION AND PATHOPHYSIOLOGY

Universitat Autònoma de Barcelona

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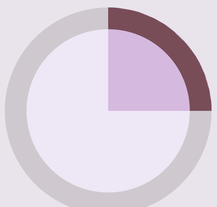
OBJECTIVES

- Define the metabolic syndrome
- Describe the pathophysiology of the syndrome and the risk factors
- Define the pathological consequences of the syndrome
- Describe how to treat and prevent the syndrome

INTRODUCTION

Metabolic syndrome, despite not having a consensual definition, results from ≥3 of the following metabolic dysregulations: **central obesity**, **hypertension**, **hypertriglyceridemia, low HDL levels** and **hyperglycemia.**

It mainly affects 1/4 of the world's population, and it has become one of the biggest public health problems nowadays.



RISK FACTORS

Intrinsic factors

Genetics
Intestinal microbiome
Circadian rhythms

Extrinsic factors

Caloric diet
Sedentary behaviour

PATHOPHYSIOLOGY

VISCERAL ADIPOSITY

↑ Free fatty acids

Skeletal muscle
↓ GLUT-4
↓ Glucose uptake

Liver
↑ Gluconeogenesis
↑ Lipogenesis

↑ Insulin secretion

Pancreas
↑ Insulin secretion

Adipokines

Hyperleptinemia
Hypoadiponectinemia

↑ Proinflammatory cytokines
(IL-6 and TNF-α)

RAAS

↑ Reactive oxygen species

↓ NO

↑ PAI-1

INSULIN RESISTANCE + HYPERINSULINEMIA

HYPERGLYCEMIA

LOW-GRADE CHRONIC INFLAMMATORY STATE

HYPERTENSION

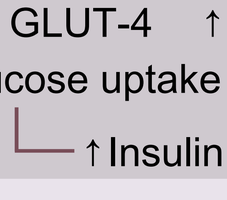
PROTHROMBOTIC STATE

PATHOLOGICAL CONSEQUENCES

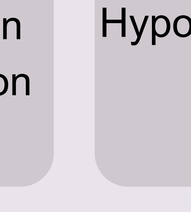
TYPE 2 DIABETES MELLITUS

CARDIOVASCULAR DISEASE

METABOLIC SYNDROME



OBSTRUCTIVE SLEEP APNEA SYNDROME



NON-ALCOHOLIC FATTY LIVER DISEASE

TREATMENT AND PREVENTION

- ☑ Healthy lifestyle
  - Mediterranean diet
  - Regular aerobic physical activity
- ☑ Pharmacological treatment to control: hypertension, hypercholesterolemia, hyperglycemia
  - ⚠ secondary hyperglycemia?
- ☑ Treatment of secondary pathologies

CONCLUSIONS

- Maintaining a **healthy lifestyle** is crucial to avoid metabolic syndrome.
- **Some individuals** are more likely to suffer from metabolic syndrome than others.
- **Central obesity** is only 1 of the 5 diagnostic criteria associated with the metabolic syndrome.
- It is necessary to **stipulate the diagnostic parameters** to allow a better diagnosis of the metabolic syndrome.
- **More research** is needed as well as **dissemination and awareness.**