

# **Diabetes e Hipogonadismo: estamos dando a devida importância?**

por

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# Insulin resistance and management of the menopause:

Insulin resistance (IR) is associated with a number of metabolic abnormalities including glucose intolerance, dyslipidemia and central obesity (**the metabolic syndrome**), which predispose to cardiovascular disease, diabetes mellitus and some cancers.

**The incidence of many of these conditions increases after the menopause, a time when IR also increases.**

# Metabolic syndrome and menopause:

*cross-sectional study in gynecology clinic*

**The prevalence of metabolic syndrome was higher in postmenopausal women than in premenopausal women. The main risk factor for the increase in this prevalence was *age*.**

*Menopause, when it is analyzed alone, did not constitute a risk factor for metabolic syndrome.*

# Menopause and metabolic syndrome:

A study of 498 urban women from western India

Prevalence of MS amongst postmenopausal women was significantly higher ( $P < 0.001$ ) than that in premenopausal women .

However, this significance disappeared when data was adjusted for the confounding variable of age.

Pandey S et al. [J Midlife Health](#). 2010 Jul;1(2):63-9

# Menopause has adverse effects on lipid and glucose metabolism

*menopause is associated with a decline in insulin secretion followed by a progressive increase in insulin resistance.*

**Hormone replacement therapy has positive effects on these changes.**

Z. M. Pirimoglu et al, Climacteric 2011;14:453-457

# Syndrom **“X”**

*“To emphasize that **insulin resistant** persons were at increased risk to develop both **type 2 diabetes mellitus** and CVD the term **“syndrome X”** was introduced as a conceptual way to understand why a defect in insulin action could increase CVD in nondiabetic individuals”*

# Síndrome “X”

- ✓ Insulino-resistência
- ✓ Hiperglicemia
- ✓ Hipertensão arterial
- ✓ cHDL baixo
- ✓ cVLDL alto
- ✓ TG altos

GM Reaven. Diabetes 1988;37:1595-1607

# **Síndrome Metabólica (SM)**

**É o estado intermédio entre a insulinoresistência e a Diabetes mellitus tipo 2**



# Síndrome Metabólica (SM)

Risco para DM2 , com 3 ou mais fatores :

- 30 x para mulheres
- 24 x para homens

# Síndrome Metabólica (SM)

*“The Metabolic Syndrome is a constellation of interrelated risk factors of metabolic origin – metabolic risk factors – that appear to directly promote the development of atherosclerotic cardiovascular disease”*

NCEP-Circulation 2002;106:3143-3421

# Síndrome Metabólica (SM)

*“The prevalence of the Metabolic Syndrome rises from the earlier stages of the menopausal transition while it was not detected in the premenopausal group.”*

Mesch VR et al. Climacteric 2006;9:40-48

# **Glucose tolerance of premenopausal women after menopause due to surgical removal of ovaries**

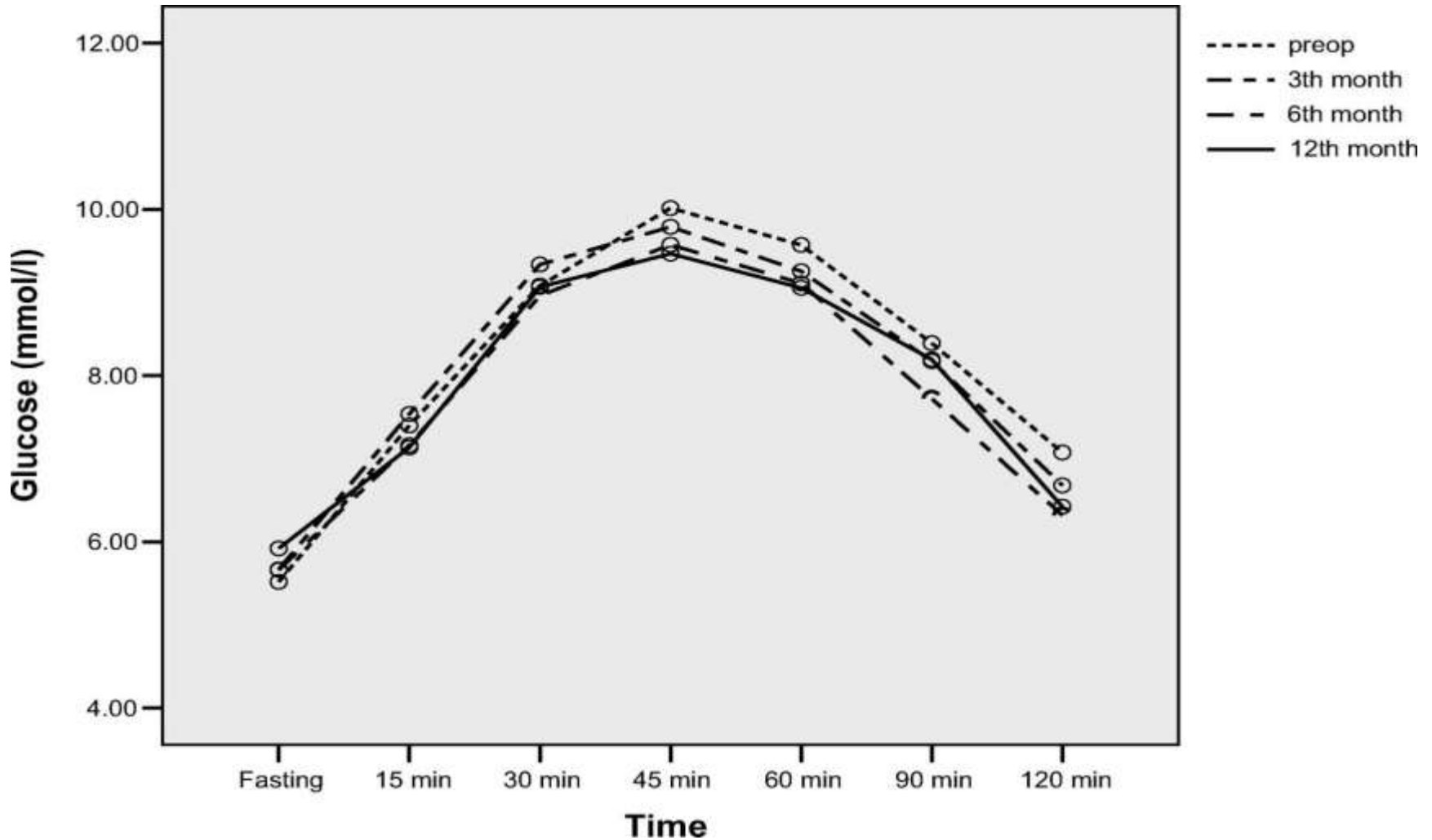
Z. M. Pirimoglu et al, Climacteric 2011;14:453-457

# Menopause has adverse effects on lipid and glucose metabolism

- We found increasing insulin resistance after oophorectomy in our study;
- 17 patients of 30 developed glucose intolerance or type 2 diabetes mellitus in the 12-month period.
- We know that impaired glucose tolerance may cause not only an increase in visceral adipose tissue and waist–hip ratio, but also cardiovascular disease

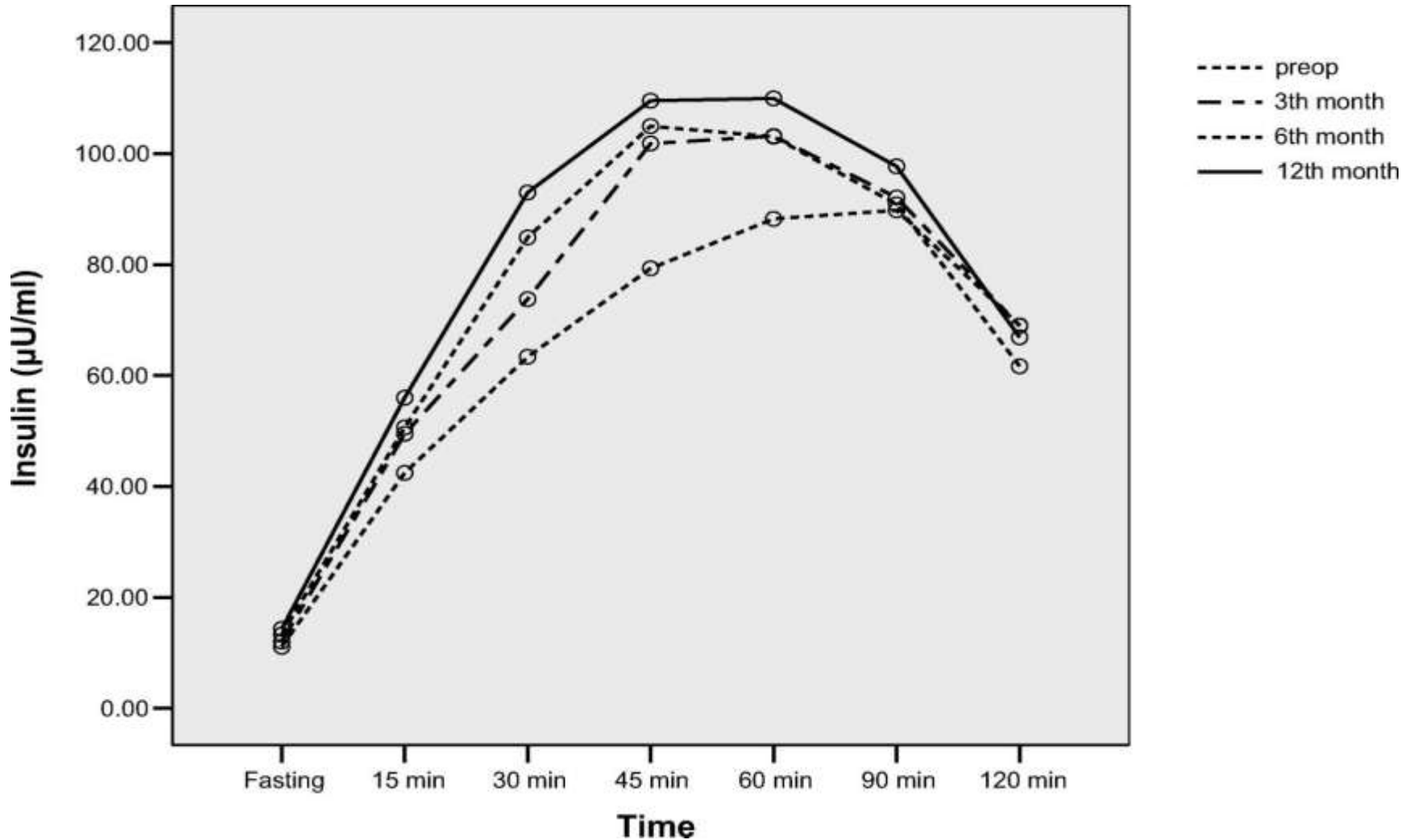
# Glucose tolerance after surgical removal of ovaries

## *Glucose levels (mmol/l) in plasma during OGTT*



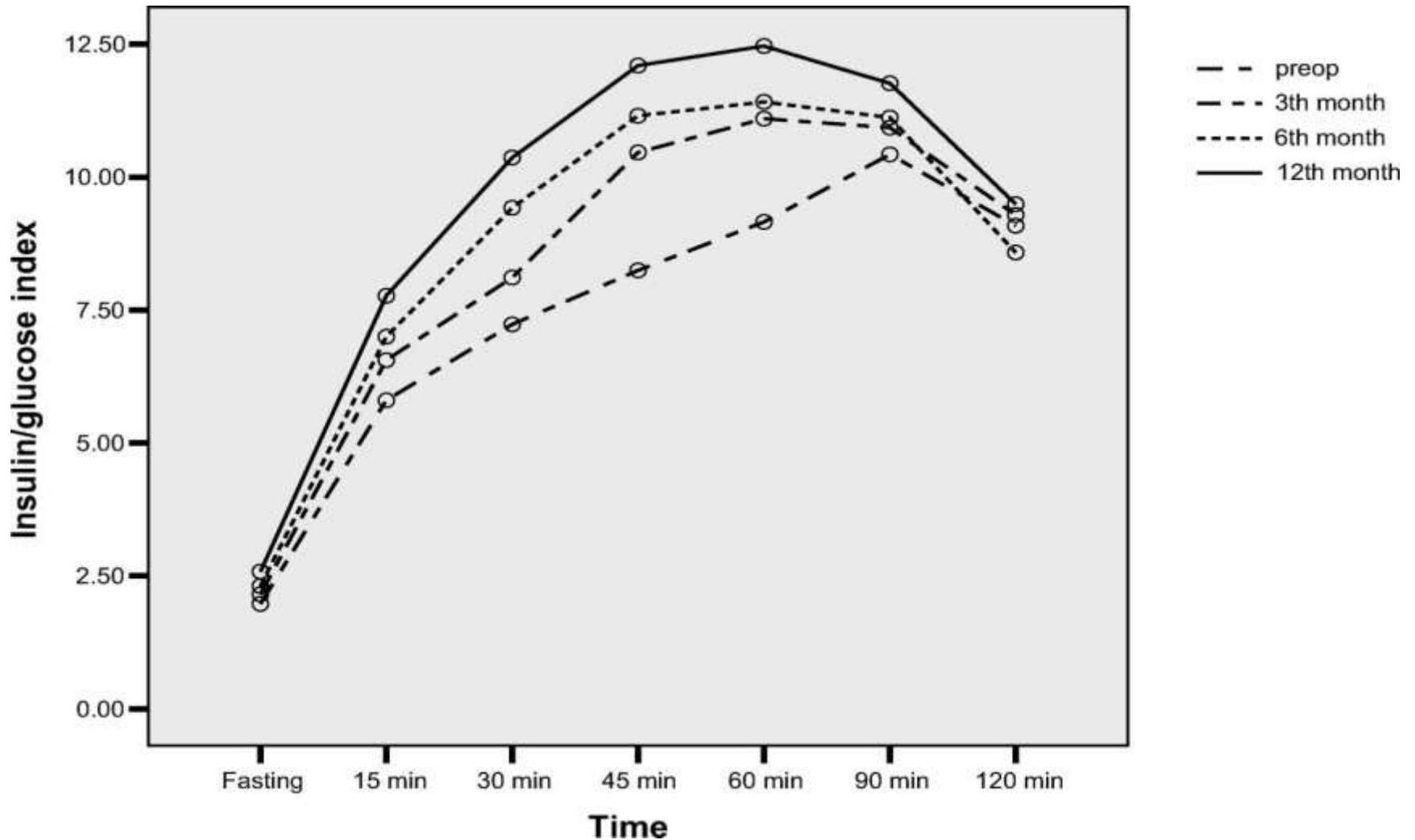
# Glucose tolerance after surgical removal of ovaries

*Insulin levels ( $\mu\text{U/ml}$ ) in plasma during OGTT*



# Glucose tolerance after surgical removal of ovaries

## *Insulin/glucose index during OGTT*





# Conclusões

**Uma menopausa tardia tem maior risco para IR e SM porque a idade é maior.**

# Conclusões

**Uma pós-menopausa não compensada com TH é causa frequente de excesso de peso e de dislipidémias.**

# Conclusões

**A resultante *síndrome X* é um risco para diabetes tipo 2(DM2)**

# Conclusões

**O hipogonadismo da pós-menopausa pode constituir um risco para a DM2**

# Conclusões

**A terapia com estrogênios pode ser uma das medidas preventivas da DM2**