



# Irisin and abdominal obesity in preschool age.

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## Background

Since its discovery in 2012 the "browning" adipokine irisin is known to lead to increased thermogenesis and energy expenditure. Studies in children are scarce, with results similar to most studies in adults.

## Objectives

To establish a link between total and abdominal fat mass, physical activity and irisin in preschool age.

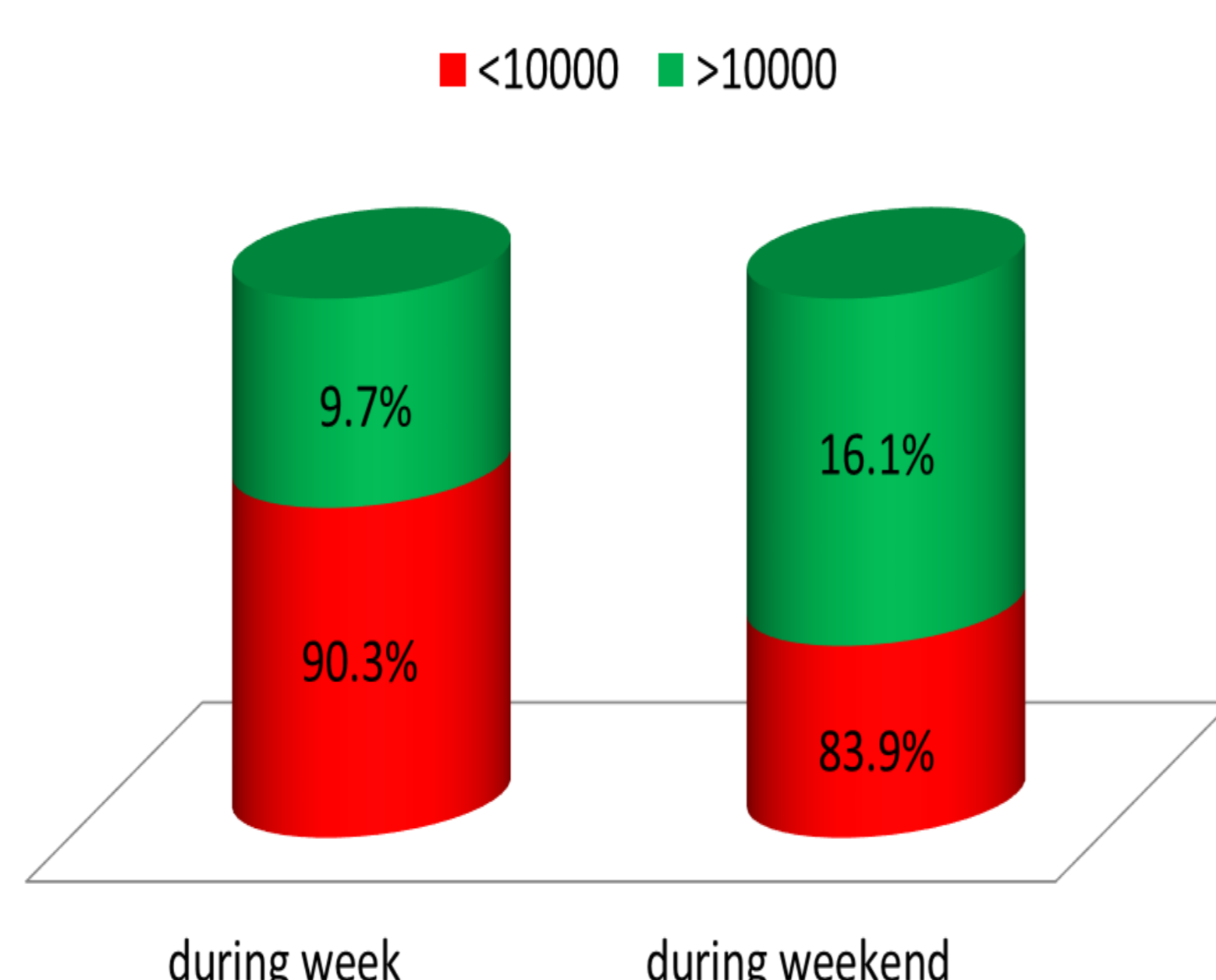
## Methods

Height, weight and waist circumference (WC) of 40 healthy pre-pubertal children were measured at mean age of  $5.31 \pm 0.74$  years. Normal weight, overweight and obesity were defined by BMI values compared to the age and sex specific CDC 2000 reference, while abdominal obesity was defined as WC > 90th percentile, according to own published reference. Blood for testing was taken after 12 hours of overnight fasting. Children wore pedometers to measure physical activity (PA). A DXA scan was performed to determine and validate abdominal obesity.

## Results

- 17.5% obese;
- Minimum recommendations for physical activity met:
  - during weekdays 9.7% of all ;
  - at weekends 16.1% of all

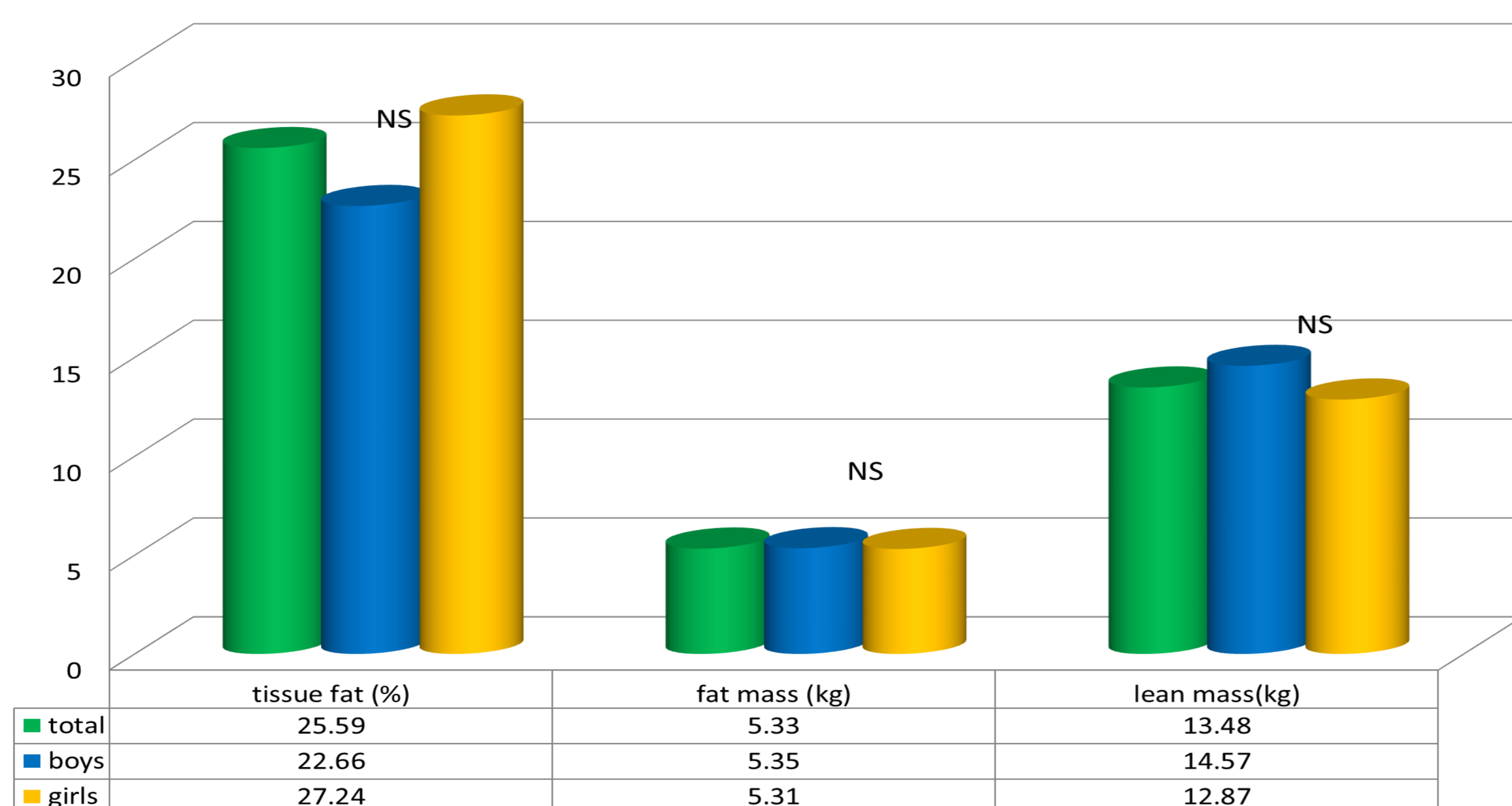
Children completing minimal PA recommendations of 10 000 steps/day



The mean irisin level was  $0.95 \pm 2.39$  ug/ml, without significant sex difference ( $p=0.451$ ).

|                           |       | n  | mean | SD   | 95% CI      |             |      |       |
|---------------------------|-------|----|------|------|-------------|-------------|------|-------|
|                           |       |    |      |      | Lower limit | Upper limit | Min  | Max   |
| irisin ug/ml<br>$p=0.451$ | boys  | 14 | 0.59 | 0.34 | 0.39        | 0.78        | 0.25 | 1.35  |
|                           | girls | 16 | 1.26 | 3.27 | -0.48       | 3.00        | 0.20 | 13.51 |
|                           | total | 30 | 0.95 | 2.39 | 0.06        | 1.84        | 0.20 | 13.51 |

Body composition in preschool children – mean parameters



Total fat mass (FM) by DXA correlated significantly with BMI and WC ( $p < 0.001$ ).

Irisin serum levels correlated with:

- total fat mass ( $r=0.406$ ;  $p=0.039$ )
- BMI and WC (n.s.)
- Children with WC > 90th percentile had higher irisin ( $p=0.025$ ).
- Children, covering minimum requirements for PA (>10,000 steps/day) had higher irisin.

When analyzing the factors with a potential influence on serum concentrations of irisin (age, sex, indicators of obesity, body composition, physical activity), only WC has a positive significant effect ( $\beta=1.333$ ;  $p=0.025$ ).

## Conclusion

This study finds a significant association between total fat mass, abdominal fat, waist circumference, PA and irisin in healthy children. Irisin is definitely an interesting biomarker for studying the interrelations between fat mass and muscle.

Conflict of interests: none

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