Leucocyte telomere length (LTL) is a robust marker of biological aging and is associated with obesity and cardiometabolic risk factors even in childhood and adolescence.

**AIM**

Aim of this prospective study was to assess the effect of a structured, comprehensive, multidisciplinary, personalized, lifestyle intervention program of healthy diet and physical exercise on LTL of overweight and obese children and adolescents according to their success at losing weight, their gender and pubertal status.

**MATERIALS & METHODS**

- **508 children and adolescents** (age: 10.14yrs ± 0.13yrs)
  - 239 males, 269 females; 282 prepubertal, 226 pubertal).
- **Obese** (n=267, 52.6%), overweight (n=174, 34.2%) or of normal BMI (n=67, 13.2%) according to the IOTF cut-off points
- Studied prospectively for one year.
- Followed an individualized dietary, exercise, and psychological support program with frequent clinical and laboratory evaluations.
- LTL were measured with quantitative real-time PCR and telomeric restriction fragments (TRF) method at the beginning and following 12 months intervention.
- Success of the intervention was assessed by employing two criteria: 1. The change (improvement) of IOTF category and 2. The change of BMI z-score by 0.6.
- Secondary measures were metabolic and hormonal parameters that are known to change in obesity.

**RESULTS**

Following 12 months intervention we found:
- Significant decrease of BMI z-score (1.72±0.06; P<0.01).
- In 193 subjects (47.42%) IOTF category improved.
- In 175 subjects (42.99%) BMI z-score decreased by 0.6.
- LTL increased significantly, in all patients
  - LTL baseline: 1.35±0.01.
  - LTL 12 months: 1.41±0.01, (P<0.01)
- LTL increase was independent of gender, pubertal status or BMI.
- Waist circumference was the best negative predictor of LTL at initial assessment.

**CONCLUSIONS**

- Implementing an individualized lifestyle intervention program in childhood for 1 year, leads to an increase of LTL independent of gender, pubertal status or success at weight loss.
- Given that LTL increased and especially independently of success at weight loss provides an additional argument on the importance of adopting a healthy lifestyle.
- Further long-term RCTs are required to assess potential associations of LTL in childhood with a favorable metabolic profile and decreased cardiovascular morbidity later in life and potentially longevity.

**REFERENCES**