

**Normalization of Haemostatic Alterations in Overweight Children with weight loss due to lifestyle intervention**

*Fritsch P. (1), Koestenberger M. (1), Fritsch M. (3), Heinzl B. (1), Nagel B. (1), Rehak T. (1), Mangge H. (4), Gamillscheg A. (1), Muntean W. (1), Reinehr T. (2)*

*Department of Paediatrics, Medical University of Graz, Austria (1); Vestische Hospital for Children and Adolescents, University of Witten/Herdecke, Germany (2); Department of Paediatrics, Medical University of Vienna, Austria (3); Clinical Institute of Medical and Chemical Laboratory Diagnosis, Medical University of Graz, Austria (4)*

Background: Obesity has been shown to be associated with a hypercoagulable state. However, the effect of weight loss on these haemostatic alterations has not been studied yet with an overall function test such as the thrombin generating test (TG) in obese children.

Methods: We prospectively determined weight status as SDS-BMI, fibrinogen, and performed TG determining time to peak (TTPeak), peak, time preceding the thrombin burst (lag-time), and 'endogenous' thrombin potential (ETP) in 27 overweight children (mean age 11.9 +/-2.4 years, 45% female, mean BMI 27.5 +/-5.6 kg/m<sup>2</sup>, mean SDS-BMI 2.31 +/-0.48) both at baseline and after 1 year lifestyle intervention based on nutrition education, exercise therapy, and psychological care. Furthermore, thrombin generating test and fibrinogen were determined in 50 healthy children of the same age.

Results: Overweight children demonstrated significantly ( $p=0.013$ ) higher fibrinogen levels, shorter lag-time ( $p<0.001$ ) and TTPeak ( $p=0.028$ ) as compared to normal-weight children. Furthermore, ETP ( $p<0.001$ ) and peak ( $p<0.001$ ) were significantly higher in overweight children than in normal-weight children. The overweight children reduced their degree of overweight significantly ( $-0.45 \pm 0.22$  SDS-BMI,  $p<0.001$ ). At the end of the lifestyle intervention, all haemostatic alterations normalized (significant decrease of fibrinogen ( $p=0.036$ ), ETP ( $p=0.034$ ), and peak ( $p=0.001$ ); significant increase of lag-time ( $p=0.040$ ) and TTPeak ( $p<0.001$ ).

Conclusions: These alterations in the haemostatic system in obese children normalized after weight loss due to lifestyle intervention demonstrating their reversibility.