Prevalence and characterization of retinal alterations in a cohort of overweight and obese children

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Background
Increasing incidence of pediatric obesity has been observed worldwide. Metabolic syndrome, characterized by visceral obesity, dyslipidemia, hypertension and impaired glucose metabolism, is associated with obesity.

Objectives
To evaluate early ocular signs of hypertension by retinography in a cohort of overweight (BMI>85th) or obese (BMI > 95th) children, in order to:
1) define the prevalence of retinal alterations;
2) characterize the patients.

Methods
All subjects underwent retinography, anthropometric examination, blood pressure measurement, oral glucose tolerance test (OGTT), lipid profile assessment, ECG and DEXA scan to evaluate body composition. The same paediatric endocrinologist examined all patients and all retinographies were evaluated by the same ophthalmologist.

Results
115 children (59 males), aged 12.83±1.96 years, were included in the study:
- 105 patients (91.3%) showed normal retinographic pattern or aspecific retinal vessel alterations (Group A);
- 7 (6.1%) showed signs of hypertensive retinopathy (in 1 case papilledema) representing Group B;
- 3 (2.6%) had different alterations, as coloboma or choroidal nevus (Fig. 1).

In the comparison between Group A and B, the latter showed significant higher values in BMI (p=0.018), BMI SDS (p=0.006), abdominal circumference (AC) (p=0.042), wrist circumference (p=0.024), AC/height ratio (p=0.007) and glycemia at 120' during OGTT (p=0.019).

No significant differences in blood pressure or between sexes were found.

Interestingly, 3/7 patients of Group B were overweight but not obese. All but one retinographies with alterations were detected in pubertal patients. The only prepubertal child with altered retinography had a complex form of obesity and is currently being studied.

No ECG alterations were found in Group B.

Conclusions
Retinal alterations could represent early signs of hypertension in children with overweight and obesity, even when blood pressure appears normal at routine measurements.