Longitudinal association of the anti-inflammatory serum marker GDF-15 with serum IgA and IgG in apparently healthy children

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Introduction

Both the innate and adaptive immune responses are deregulated in individuals with obesity and are a key driver of its associated metabolic alterations. Although the anti-inflammatory growth differentiation factor 15 (GDF-15) is a candidate protein against obesity, its mechanisms regulating the immune responses are not fully understood.

Methods

We examined whether serum GDF-15 was related to serum levels of immunoglobulins in a cohort of healthy children recruited at the primary health care centers of Girona, in Northeastern Spain (204 Caucasian children, 101 girls and 103 boys). Children were assessed longitudinally at baseline (8.5 ± 1.8 years) and follow-up (13.0 ± 1.9 years, Table 1). At baseline, children were classified according to BMI (above/below median BMI z-score = 0.62 ± 1.4) or renal fat (above/below median).

Results

GDF-15 positively associated with IgA and IgG levels and the IgA*IgG product in apparently healthy children at both baseline and follow-up (Figure 1). The associations were more pronounced in heavier children (those with BMI-SDS above the median) as well as in children with higher accumulation of renal fat (those with renal fat-to-height ratio above the median), in whom they remained significant after correcting for possible confounding variables (Table 2). Serum GDF-15 levels accounted for up to 16% of the variance of IgG levels and 14% of the variance of IgA*IgG product at follow-up.

Conclusion

The longitudinal associations of the anti-inflammatory GDF-15 with IgA, IgG and the IgA*IgG product in children with higher BMI or higher renal fat accumulation suggest a role of GDF-15 in human obesity through the regulation of the adaptive immune system.