

DETERMINANTS OF SERUM INTERLEUKIN-1 RECEPTOR ANTAGONIST CONCENTRATIONS IN 12-YEAR-OLD CHILDREN BORN SMALL OR APPROPRIATE FOR GESTATIONAL AGE

ePoster P3-830 - Fat

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The authors have nothing to disclose



BACKGROUND

Elevated concentrations of interleukin-1 receptor antagonist (IL-1Ra) have been found in adult subjects with the metabolic syndrome and type 2 diabetes as a marker of inflammation^{1,2}.

OBJECTIVE AND HYPOTHESES

Our aim was to study whether serum IL-1Ra associates with markers of reduced insulin sensitivity (IS) and dyslipidemia in 12-year-old children.

METHODS

A total of 192 children (109 girls) were studied at the mean age of 12.25 years (range 12.01-12.73). Seventy eight of them had been born appropriate for gestational age (AGA), 70 small for gestational age (SGA), and 44 from preeclamptic (PRE) pregnancies as AGA (Table 1). Fasting serum IL-1Ra, high molecular weight adiponectin (HMW-adipo), leptin, sex-hormone binding globulin (SHBG), insulin, IGFBP-1, HDL cholesterol, triglycerides and blood glucose were measured. IS was estimated by Quantitative Insulin Sensitivity Check Index (QUICKI).

RESULTS

The means of serum IL-1Ra, HMW-adipo, IGFBP-1, SHBG, leptin, insulin, blood glucose and QUICKI did not differ between the children born SGA, AGA or from PRE pregnancies ($p > 0.05$ for all). In the whole study population, serum IL-1Ra correlated negatively with SHBG and positively with triglycerides ($p < 0.01$ for both). The children in the highest IL-1Ra tertile had significantly lower QUICKI ($p = 0.001$), IGFBP-1 ($p = 0.001$), SHBG ($p < 0.001$) and HDL cholesterol concentrations ($p = 0.016$), and higher BMI, weight-for-height, serum insulin, leptin ($p < 0.001$ for all) and triglyceride concentrations ($p = 0.037$) when compared to the children in the lowest IL-1Ra tertile (Table 2). Pubertal development or sex distribution did not differ significantly between the highest and lowest IL-1Ra tertile subjects.

CONCLUSION

The children with the highest IL-1Ra levels had lower IS and HDL cholesterol, and higher triglycerides than those with the lowest IL-1Ra levels suggesting that high IL-1Ra concentrations associate with unfavourable metabolic features.

REFERENCES

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Table 1. Anthropometric measures at birth and at the examination. The means (SD) are presented.

Variable	All (n=192)	AGA (n=78)	SGA (n=70)	PRE (n=44)
At birth				
Gestational age (wk)	37.7 (3.2)	38.0 (3.3)	37.6 (3.1)	37.2 (3.2)
Weight (g)	2769 (754)	3158 (696)	2238 (507)	2926 (698)
Weight (SDS)	-1.14 (1.34)	-0.23 (0.97)	-2.52 (0.57)	-0.57 (0.92)
Length (cm)	47.3 (3.8)	48.9 (3.5)	44.9 (3.0)	48.2 (3.3)
Length (SDS)	-0.88 (1.47)	-0.02 (1.05)	-2.30 (0.94)	-0.14 (0.98)
At the examination				
Age (yr)	12.25 (0.17)	12.28 (0.16)	12.23 (0.18)	12.24 (0.15)
Weight (kg)	44.18 (10.64)	47.32 (11.98)	40.27 (8.17)	44.8 (9.8)
Weight-for-height (%)	104.1 (18.4)	106.2 (20.4)	100.6 (17.4)	105.7 (15.5)
BMI (kg/m ²)	18.67 (3.48)	19.31 (3.94)	17.79 (3.07)	18.96 (2.99)
Height (cm)	153.1 (7.6)	155.9 (7.2)	150.1 (7.1)	153.1 (7.4)
Height (SDS)	0.26 (1.03)	0.63 (0.96)	-0.19 (0.96)	0.33 (0.98)

Table 2. Comparison between the lowest, middle, and highest IL-1Ra tertiles. The means (SD) are presented.

Variable	Lowest IL-1Ra tertile (n=64)	Middle IL-1Ra tertile (n=64)	Highest IL-1Ra tertile (n=63)	p-value*
S-Insulin (mU/l)	9.0 (1.0)	9.8 (0.8)	11.8 (1.2)	<0.001
QUICKI	0.358 (0.006)	0.352 (0.005)	0.343 (0.006)	0.001
S-IGFBP-1 (µg/l)	74.7 (9.5)	67.0 (7.1)	56.6 (9.9)	0.001
S-SHBG (nmol/l)	85.2 (8.2)	79.0 (7.3)	56.3 (7.3)	<0.001
S-HMW adiponectin (mg/l)	5.6 (0.8)	5.5 (0.7)	4.8 (0.6)	0.405
S-Leptin (µg/l)	9.4 (range 0.3-52.4)	10.7 (range 0.9-41.0)	25.3 (range 0.8-101.5)	<0.001
S-Triglycerides (mmol/l)	0.81 (0.07)	0.95 (0.11)	0.99 (0.11)	0.037
S-HDL cholesterol (mmol/l)	1.40 (0.07)	1.31 (0.07)	1.26 (0.06)	0.016
BMI (kg/m ²)	16.9 (0.5)	17.8 (0.6)	21.2 (1.0)	<0.001
Weight-for-height (%)	95.2 (2.8)	99.3 (3.3)	117.4 (5.2)	<0.001
Gender [F/M (n)]	36/28	42/22	31/32	0.174 [¶]
Pubertal development ^{¶¶} [early/late stage (n)]	39/25	31/33	36/27	0.347 [¶]

* Independent-Samples Kruskal-Wallis test, Bonferroni-adjusted p-value, comparison between the lowest and the highest IL-1Ra tertiles

¶ Chi-square test

¶¶ Early stage of puberty: the breast or genital scores 1-2, late stage of puberty: the breast or genital scores 3-5

