METABOLIC ENDOTOXEMIA IN EGYPTIAN OBESE CHILDREN AND ADOLESCENTS

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Background

- Obesity is associated with metabolic abnormalities, which result to progression to insulin resistance and the metabolic syndrome. The underlying stimulus for these metabolic abnormalities in obesity is not clear, however recent evidence suggests that systemic, low level elevations of gut derived endotoxin (lipopolysaccharide) may play a role in obesity related metabolic abnormalities.

Objective

- Study the metabolic endotoxemia in obese children and adolescents and its potential relation to insulin resistance, lipid profile and hs-CRP.

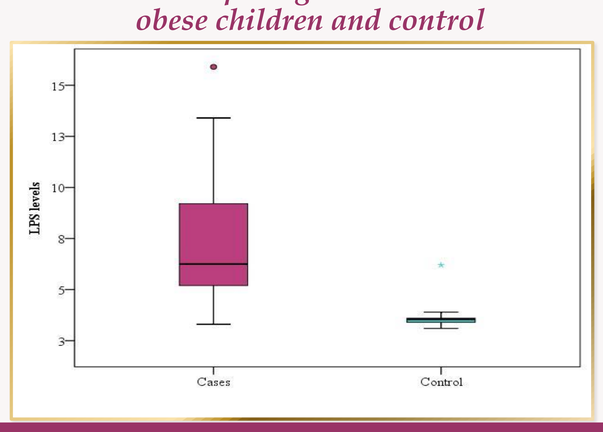
Subjects & Methods

- The study included thirty obese children and adolescents aged 5–18 years and 20 non obese children matched for age and sex as control group. Lipid profile, liver function tests, hs-CRP and serum lipopolysaccaride (LPS) were done, Insulin resistance was calculated using Homeostasis model assessment (Homa-IR) and quantitative insulin sensitivity check index (QUICKI), abdominal ultrasound was done for detection of fatty liver.

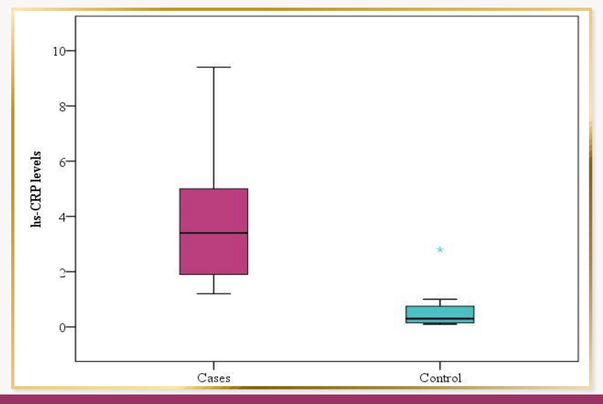
Results

- The mean age in obese children was 10.23 ± 3.08 years compared to 9.15 ± 2.89 years in the control group. hs-CRP and LPS were significantly higher in obese group compared to the control. There was a significant positive correlation between serum LPS with BMI, waist circumference, TG, cholesterol, fasting insulin, HOMA- IR, hs-CRP and frequency of eating junk food. Also there was a significant negative correlation between LPS with HDL, physical activity and QUICKI.

Box Plot comparing LPS levels between obese children and control



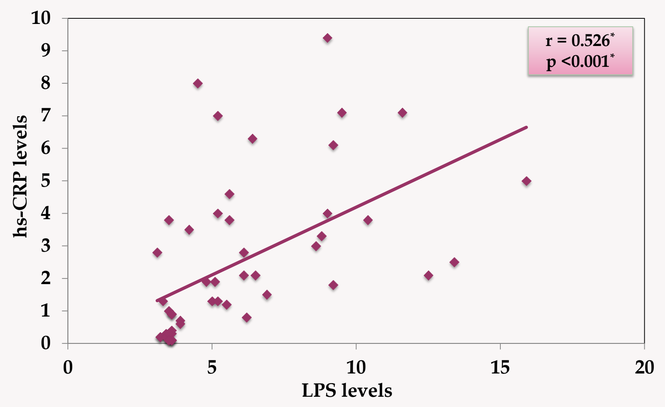
Box Plot comparing hs-CRP levels between obese children and control



Correlation between LPS and different parameters in total sample (n=50)

	LPS	
	Total sample	
	r	p
Age	-0.190	0.185
BMI	0.471*	0.001*
BMI percentile	0.557*	<0.001*
Waist circumference	0.336*	0.017*
Hip circumference	0.336*	0.017*
Acanthosis grading	0.261	0.067
Systolic BP	0.243	0.089
Diastolic BP	0.164	0.255
TG	0.330*	0.019*
Cholesterol	0.494*	<0.001*
HDL	-0.058	0.691
LDL	0.019	0.896
Fasting glucose	0.263	0.065
Fasting insulin	0.653*	<0.001*
ALT	0.200	0.163
AST	0.116	0.422
HOMA -IR	0.601*	<0.001*
QUICKI	0.642*	<0.001*
hs-CRP	0.526*	<0.001*
Frequency of junk food	0.285	0.045*
Physical activity	0.392*	0.005*

r: Pearson coefficient , *: Statistically significant at $p \leq 0.05$



Correlation between hs-CRP and LPS in total sample

Conclusions

- Metabolic endotoxemia may have a role in cardio-metabolic disease risk factors associated with obesity in children and adolescents.

References

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No conflict of interest

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