

HOMA-IR IN OBESE CHILDREN WITH BMI ≥ 2.5 SDS, BUT NOT < 2.5 SDS, DIFFER SIGNIFICANTLY FROM NORMAL WEIGHT CHILDREN

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INTRODUCTION

- Pediatric obesity remains an ongoing serious international health concern threatening adult health and longevity.
- Screening for comorbidities of obesity should be applied in a hierarchical, logical manner for early identification before more serious complications result.

AIM

Compare HOMA-IR between obese and normal weight children.

RESULTS

- Mean age was 9.5 yrs (SD, 3.07),
- BMI: 2.28 (SD, 0.59),
- HOMA-IR: 3.88 (SD, 3.6),
- fasting glucose: 87.3 (SD, 8.3) mg/dl,
- fasting insulin: 17.9 (SD, 16) mIU/lt.
- HOMA-IR was significantly higher in group 4 only as opposed to group 1 ($p: 0.02$) but not group 2 or 3.
- Prepubertal boys in groups 2, 3, 4 and overall had higher HOMA-IR as opposed to girls (4.1/3.5, boys/girls), but in puberty this finding was reversed (3.6/4.4 boys/girls).
- However, there was no statistically significant difference among groups in relation to sex or puberty.

Table 1. Clinical and laboratory characteristics

	Group 1 (n=55)	Group 2 (n=78)	Group 3 (n=70)	Group 4 (n=89)	p
Age (yrs)	10.9 (2.4)	9.7 (2.2)	9.5 (2.8)	7.6 (3.6)	*
Sex (boys/girls)	20/35	37/41	32/38	47/42	NS
Tanner stage I/II-IV	20/35	47/31	36/34	60/29	*
BMI z-score	1.7 (0.27)	2.1 (0.06)	2.4 (0.08)	2.9 (0.65)	*
HOMA IR	3.1 (1.0)	3.6 (3.0)	3.9 (2.7)	4.6 (5.1)	*
< 3.4	69%	62%	52%	52%	
≥ 3.4	31%	38%	48%	48%	
Fasting Glucose (mg/dl)	89 (8.6)	87 (8.3)	87 (7.8)	86 (8.2)	*
Fasting Insulin (mIU/lt)	14 (8)	17 (14)	18 (11)	21 (23)	*

METHOD

- 292 children (156 females), BMI (≥ 2 SD), Tanner stage 1/ >2 : 163/129, divided in four groups
- Group 1: $0 \leq \text{BMI} < 2 \text{SD}$,
- Group 2: $2 \text{SD} \leq \text{BMI} < 2.25 \text{SD}$,
- Group 3: $2.25 \text{SD} \leq \text{BMI} < 2.5 \text{SD}$,
- Group 4: $\text{BMI} \geq 2.5 \text{SD}$ were analyzed retrospectively from the medical records.
- Age, sex, BMI, Tanner stage, fasting blood glucose and insulin as well as the homeostasis model assessment of insulin resistance (HOMA-IR) [(fasting glucose-mmol/lt*fasting insulin mIU/lt)/22.5] were recorded
- Insulin resistance was defined as $\text{HOMA-IR} \geq 3.4$.
- One-Way and Two-Way Analysis of variance (ANOVA), $p < 0.05$ were calculated among groups using the SPSS statistics program.

CONCLUSIONS

Obese children with BMI ≥ 2.5 SDS, but not BMI < 2.5 SDS, present significantly higher HOMA-IR as opposed to normal weight children, irrespectively of sex or Tanner stage.

REFERENCES

1. Morales Camacho W. et al., Childhood obesity: Aetiology, comorbidities, and treatment Diabetes/Metabolism Research and Reviews 2019
2. Juonala et al., Childhood Adiposity, Adult Adiposity, and Cardiovascular Risk Factors NEJM 2011
3. Marloes P. van der Aa et al. How to Screen Obese Children at Risk for Type 2 Diabetes Mellitus? Clinical Pediatrics 2014

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