

INFLUENCE OF BIRTH WEIGHT ON CARDIOVASCULAR RISK FACTORS IN OBESE CHILDREN AND ADOLESCENTS

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INTRODUCTION

Birth weight (BW) is associated with the development of obesity, insulin resistance and type-2 diabetes in adulthood. The results of the studies on the correlation between BW and the severity of obesity and cardiovascular risk factors (CVRF) among obese children are controversial.

AIM

The objective of our study was to evaluate the association between birth weight and the presence of CVRF in a genetically homogeneous group of obese children and adolescents.

METHOD

789 obese children and adolescents of Sardinian descent (median age 9.54 years (2.6-17.7); 359 males, table 1), all born from uneventful pregnancies, were included in the study. Anthropometric parameters (body mass index (BMI), height, waist circumference (WC), pubertal stage (Tanner stage), systolic and diastolic blood pressure (SP, DP), lipids profile (HDL and triglycerides (TG)), fasting plasma glucose (GLU), and insulin were assessed. The HOMA index was calculated as insulin resistance index. Patients were divided according to BW into 5 groups (table 2). Full term patients (≥ 37 GW and ≤ 41 GW) were also analysed separately.

| | |
|------------------|-------------------|
| Age (y/o) | 9,54 (2,61-17,76) |
| Weight (gr) | 3310 (1140-5530) |
| Sex (M/F) | 359/430 |
| BMI-SDS | 2,02 (0,86-4,17) |
| WC (percentiles) | 91 (15-99) |
| SP (mmHg) | 105 (70-175) |
| DP (mmHg) | 60 (40-100) |
| GLU (mg/dl) | 88 (59-133) |
| Insulin (mU/l) | 11,95 (2-91) |
| HOMA-IR | 2,56 (0,33-22,63) |
| HDL (mg/dl) | 51 (21-131) |
| TG (mg/dl) | 58 (4,2-432) |

Table 1. Characteristics of all patients. Data are reported as median and range

RESULTS

The 5 groups were matched for age, BMI-SDS, gender and pubertal status. Median insulin and HOMA values were higher in GP0 than in the other groups ($p=0.02$ and $p=0.03$, respectively. Figures 1 and 2).

Median HDL was lower in GP1 than in GP2 and GP4 ($p=0.02$), similar results were obtained when only the subjects born full term ($n=706$) were considered (Figure 3). The other CVRF were similar in the 5 groups.

We separately analyzed 586 subjects belonging to GP1, GP2, and GP3 born with BW appropriate for gestational age (AGA). CVRF were similar among the 3 groups (GP1 $n=70$, GP2 $n=293$, GP3 $n=201$). Similarly, CVRF were similar among the 525 AGA full term subjects (GP1 $n=57$, GP2 $n=277$, GP3 $n=184$).

| | |
|--------------|------------------------|
| GP0 n=37 | PN<2500 gr |
| GP1 n=144 | PN \geq 2500-<3000gr |
| GP2 n=320 | PN \geq 3000-<3500gr |
| GP3 n=226 | PN \geq 3500-<4000gr |
| GP4 n=62 | PN \geq 4000gr |

Table 2. Patients groups (GP) divided according to BW

CONCLUSIONS

In our cohort of obese children and adolescents, low BW was associated with higher values of serum insulin and HOMA in the entire cohort, regardless of age, gender and pubertal stage. In the cohort of AGA and full term AGA subjects, BW is not associated with the BMI and the CVRF analysed. These findings have important clinical implications for the follow-up of obese children.

REFERENCES

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