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32 – Insulin resistance and its relation to adiposity, cardio-respiratory fitness and dietary intake among Azorean adolescents

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Introduction: Insulin resistance is an important component in the development of metabolic syndrome and lifestyle-related diseases. The aim of the present study is to investigate the relationship between insulin resistance (IR), adiposity, cardiorespiratory fitness (CRF) and dietary intake among Azorean adolescents.

Method: A cross-sectional school-based study, the Azorean Physical Activity and Health Study II, was conducted on 517 adolescents (297 girls) aged 15–18 years from the Azorean Islands – Portugal. We measured weight, height, BMI, waist circumference (WC), body fat mass, fasting glucose and insulin. IR was determined through homeostasis model assessment-insulin resistance (HOMA-IR). A HOMA-IR ≥90th percentile was considered a cardiovascular risk factor. CRF was measured with the 20-m shuttle run test. Dietary intake was obtained using a semi-quantitative FFQ.

Results: 19·1 % of the whole sample had a HOMA-IR ≥90th percentile. There was no significant difference in IR concentration between boys (1·93 ± 1·6) and girls (1·97 ± 1·0; $P > 0·05$). Pearson's correlation test for HOMA-IR and adiposity were positive and significantly ($P < 0·001$) associated with BMI ($r = 0·33$), WC ($r = 0·31$) and fat mass percentage ($r = 0·29$), while a significant but negative association was found for CRF ($r = -0·15$). The percentage of carbohydrate ($r = 0·16$, $P < 0·001$) was positive and significantly associated with HOMA-IR, whereas total fat ($r = -0·15$, $P = 0·001$) and daily energy intake ($r = -0·15$, $P = 0·001$) were negative and significantly associated with HOMA-IR.

Conclusions: To prevent the development of IR, reducing adiposity, increasing CRF could be effective strategies to prevent future metabolic diseases.

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33 – Insulin resistance (IR) and non-alcoholic fatty liver disease (NAFLD) in obese paediatric patients

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Introduction: Insulin resistance (IR), among the major metabolic alterations present in obesity, is often associated to non-alcoholic fatty liver disease (NAFLD).

Method: 323 obese children (F 163, M 160; average age = 10·09 (SD 2·75) years) have been enrolled so far. Insulin resistance-homeostasis model assessment (IR-HOMA), ALT, AST, BL (blood lipids) and BP (blood pressure) were studied, together with waist circumference (W) and W/h ratio. Children with ALT ≥ 40 U/l and/or hepatomegaly underwent liver ultrasound scan (LU) and classified as NAFLD if statosis was found.

Results: 5·88 % of the patients (F 6, M 13) had ALT ≥ 40 U/l and/or clinical hepatomegaly; 57·89 % of them (F 5, M 6) had LU signs of statosis (LU+). Besides, 53·87 % of the whole sample (F 100, M 74) showed IR-HOMA >2·5; 4·59 % of them (F 2, M 6) also had ALT >40 and LU+. Children with IR-HOMA >2·5 are at greater risk of NAFLD (OR 7·2, RR 3·2, $P < 0·025$) than those with IR-HOMA <2·5. All the other parameters considered were not altered in our subjects with LU+.

Conclusions: Our study confirms a strong association between IR and NAFLD also in paediatric obesity. Discussion is still open about the role of the two pathologies,