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**Comparison of Lipoprotein Based Insulin Resistance Score and Traditional Risk Factors in Adolescents with Obesity**

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Changes in lipoprotein profiles occur prior to overt hyperglycemia or type 2 diabetes mellitus and in association with insulin resistance. The Lipoprotein Insulin Resistance Score (LP-IR) is a weighted score of lipid particles and concentrations to quantify the multifactorial role of lipids in insulin resistance. Previously LPIR scores greater than 25 increased disease risk in adults. Identifying metabolic perturbation via LPIR in adolescents with obesity may identify at-risk individuals prior to traditional risk factors. **Purpose:** The aim of this study was to compare LP-IR scores to traditional risk factors (BMI, Total Cholesterol, LDL, HDL, TGs) in a cohort of adolescents with obesity. **Methods:** We assessed n = 69 (Age, Median (IQR) = 17 (2), Female = 51, Male = 18) adolescents with obesity (BMI = 46.5 (11.1)) for plasma lipoprotein particle concentration and diameters via automated nuclear magnetic resonance. LP-IR scores were determined as weighted calculations of LDL, VLDL, and HDL particle sizes and concentrations. Subjects were classified into quartiles based on LPIR. ANOVA was used to assess differences among quartiles for BMI, Total Cholesterol, LDL, HDL, and TGs. **Results:** LP-IR among quartile groups were Q1: 19.5 ± 7.1, Q2: 37.7 ± 4.6, Q3: 51.9 ± 2.5, Q4: 72 ± 11.7. There was no difference among quartiles for BMI ($p = 0.60$), LDL ($p = 0.77$), or total cholesterol ($p = 0.66$). Significant differences were identified for Q4 (most insulin resistant) in comparison to all other quartiles for TAG (90 ± 32 mg/dl vs. (Q1) 43 ± 18, (Q2) 51 ± 19, (Q3) 57 ± 17) and HDL (37 ± 7 mg/dl vs. 51 ± 9, 43 ± 10, 38 ± 7). **Conclusion:** Differences in risk factors (HDL and TGs) were identified in the most insulin resistant (Q4) subjects in comparison to all other groups as would be expected in MetSyn. However, subjects in Q2 and Q3 did not show significant changes in traditional risk factors in comparison to Q1 (least insulin resistant) despite LP-IR scores above 25, which has previously been associated with increased disease risk. Thus, LP-IR may be useful in identifying early pathological metabolic alterations in adolescent obesity in conjunction with identification of traditional risk factors. However larger studies are needed to better understand the LP-IR score in pediatric patients with obesity.