



POSTER PRESENTATION

Open Access

Insulin resistance and adverse lipid profile in obese pre-pubertal South Indian children

Ayyavoo Ahila^{1,2*}, Vijayakumar Vimalraj¹, Palany Raghupathy¹From 8th APPEs Biennial Scientific Meeting
Darwin, Australia. 29 October – 1 November 2014

High prevalence of obesity, type 2 diabetes mellitus (T2DM) and the metabolic syndrome (MS) are evident among children and adults in India.[1,2] Strong evidence exists for the higher risk for insulin resistance (IR) syndrome in South Asians compared to other ethnicities, thereby demonstrating the higher risk for MS in this population.[3] MS is a risk factor for cardiovascular disease (CVD) and T2DM.[4,5] Adverse metabolic features such as dyslipidaemia are seen even in childhood and persist into adulthood with important long term implications.[6,7] Lipid profile data from pre-pubertal obese children from India is sparse and hence this has been addressed for the first time in this study, along with the relationship between lipid profile and IR in south Indian children.

Heights and weights of healthy pre-pubertal children aged 4-10 years of age were measured and body mass index (BMI) was calculated. Subjects were classified as overweight (BMI \geq 85% to $<$ 95%) and obese (BMI \geq 95%) for age and sex. Complete lipid profile as well as plasma glucose and insulin were measured in fasting venous blood samples. LDL/HDL (low & high density lipoprotein cholesterol), TC (total cholesterol)/HDL and IR by HOMA-IR (Homeostatic model assessment) were analysed.

Tests used for analysing differences between groups included: unpaired t-test for quantitative variables; comparison between groups by the non-parametric Mann-Whitney test; ANOVA for quantitative variables; Pearson coefficient of correlation for relationship between the variables and the chi square test for differences in categorical variables between groups. "P" value of $<$ 0.05 using a two-tailed test was considered significant. Data were analysed with the statistical software SPSS version 16.0.

Among the 100 participants, 98 were obese and two were overweight (M:F 51:49). Insulin resistance was

observed to be higher with increased weight and BMI. A significant positive correlation was present between HOMA-IR and BMI ($r = 0.291$), triglycerides ($r = 0.214$) & TC/HDL ($r = 0.229$). A negative trend in correlation was found with HDL ($r = -0.023$).

Obese south Indian children were found to have IR and dyslipidaemia during their pre-pubertal years. Long term studies on this population and intervention measures are necessary to analyse and reduce the risk for the MS and CVD in later years.

Authors' details

¹G. Kuppaswamy Naidu Memorial Hospital, Coimbatore, India. ²Liggins Institute, University of Auckland, Auckland, New Zealand.

Published: 28 April 2015

References

1. Ramachandran A, Snehalatha C, Vinitha R, Thayyil M, Sathish Kumar C, Sheeba L, et al: Prevalence of overweight in urban Indian adolescent school children. *Diabetes research and clinical practice* 2002, **57**(3):185-90.
2. Ramachandran A, Snehalatha C, Kapur A, Vijay V, Mohan V, Das A, et al: High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. *Diabetologia* 2001, **44**(9):1094-101.
3. McKeigue P, Shah B, Marmot M: Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *The Lancet* 1991, **337**(8738):382-6.
4. Alberti KG, Zimmet P, Shaw J: The metabolic syndrome—a new worldwide definition. *Lancet* 2005, **366**(9491):1059.
5. Ford ES: Risks for all-cause mortality, cardiovascular disease, and diabetes associated with the metabolic syndrome. *Diabetes Care* 2005, **28**(7):1769.
6. Nicklas T, Von Duvillard S, Berenson G: Tracking of serum lipids and lipoproteins from childhood to dyslipidemia in adults: the Bogalusa Heart Study. *International Journal of Sports Medicine* 2002, **23**(S1):39-43.
7. Srinivasan SR, Frontini MG, Xu J, Berenson GS: Utility of childhood non-high-density lipoprotein cholesterol levels in predicting adult dyslipidemia and other cardiovascular risks: The Bogalusa Heart Study. *Pediatrics* 2006, **118**(1):201-6.

doi:10.1186/1687-9856-2015-S1-P78

Cite this article as: Ahila et al.: Insulin resistance and adverse lipid profile in obese pre-pubertal South Indian children. *International Journal of Pediatric Endocrinology* 2015 **2015**(Suppl 1):P78.

¹G. Kuppaswamy Naidu Memorial Hospital, Coimbatore, India
Full list of author information is available at the end of the article