Insulin-Like Growth Factor-I and its Binding Protein-1 in Relation to Anthropometry among Egyptian Infants of Diabetic Mothers

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Background: Infants of diabetic mothers (IDMs) are at an increased risk of morbidity and mortality related to growth abnormalities (large or small for gestational age). Insulin like growth factor-I (IGF-I) plays a key role in regulating fetal growth. Objective: Estimate association between intrauterine fetal growth assessed by anthropometric measurements and biochemical growth factors; IGF-I and IGF binding protein-1 (IGFBP-1) in IDMs.

Subjects and Methods: Cross-sectional study was carried out on 69 full terms IDMs who were admitted to the neonatal intensive care units, Ain Shams University Hospitals. They were subjected to detailed history, thorough clinical examination, anthropometric measurements; including birth weight, length, head circumference, mid-arm circumference, skin fold thickness at triceps and subscapular areas and placental weigh; and laboratory investigations; including maternal citeHbA₁c cite and cord blood IGF-I and IGFBP-1. They were classified into three groups: 20 small for gestational age (SGA), 25 appropriate for gestational age (AGA) and 24 large for gestational age (LGA).

Results: Most of the SGA neonates were born to mothers with type I diabetes, while most of AGA and LGA were born to mothers with gestational diabetes. According to maternal citeHbA₁c cite, all SGA and LGA neonates were born to metabolically uncontrolled mothers while AGA neonates were born to well-controlled diabetic mothers. All the anthropometric measurements had significant positive correlations with IGF-I and negative correlations with IGFBP-1.

Conclusions: Good control of diabetes during pregnancy is essential to improve fetal growth. There is opposing relationship between cord blood IGF-I and IGFBP-1 on the anthropometric measurements. Head circumference is the best predictor of IGF-1 among IDMs.
Relation between Multiple Markers of Diabetes and Abdominal Obesity in Obese Egyptian Adolescent Girls

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Inflammation is believed to be the ‘common soil’ leading to the development of type 2 diabetes but the trigger of inflammation is unclear. Elevated plasma concentrations of many inflammatory markers are associated with obesity in adult but this association is less clear in children and adolescents.

Objective was to investigate the relation between some inflammatory markers as predictors of the incidence of type 2 diabetes in obese adolescent girls (n=90); in group with central obesity (n=45) compared to obese group without central obesity (n=45).

Method: They aged 13–18 years with body mass index 97 percentile for age and gender based on the Egyptian Growth Reference Charts 2008. Waist to hip ratio (WHR) was taken as a measure of central obesity and used to divide the participating students into two groups: group I with WHR 0.8 and group II with WHR 0.8. The determined markers were C-reactive protein (CRP), Apolipoprotein B (ApoB) and Ferritin.

Results: There were a very high significant (p<0.05) increase in CRP, ApoB and Ferritin levels in group I when compared to group II with a high positive significant correlation between CRP and both of ApoB and Ferritin at r=0.895 and r=0.618 respectively and positive significant (p<0.05) correlation between ApoB and Ferritin at r=0.818 in group I. A very high significant (p<0.05) correlation was found between WHR and the measured markers CRP, ApoB and Ferritin at r=0.766, r=0.650 and r=0.442 respectively. CRP, ApoB and Ferritin were the cornerstone markers of inflammation and can be used as early predictors of diabetes.

Conclusion: this study focused on avoiding of being obese with remarked central obesity throughout adolescent period in Egypt by recommending an effective program to follow up the central obesity, to decrease the risks of the initiated inflammatory molecules for the protection from the associated complications in the future.
Multiple Daily Injection vs Subcutaneous Insulin Infusion: A Retrospective Cohort Study

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Objective: Physiological insulin regimes are recommended by the International Society of Pediatric and Adolescent Diabetes. Continuous subcutaneous insulin injection pumps (SCII) have been developed to match physiological insulin profiles closely. An observational cohort study was conducted to assess glycaemic control on individuals using multiple daily injections (MDI) of insulin and SCII. The aim was to identify whether the treatment of a cohort of patients with pump therapy resulted in significant improvements in HbA1c.

Method: A retrospective cohort study compared two groups: patients treated solely with MDI regimes and those changed from MDI regimes to SCII therapy. All patients with type 1 diabetes mellitus who had been treated by the paediatric team at The Countess of Chester Hospital over a five year period from 2007-2012 were identified and their annual HbA1c values were noted. The mean change in these values was compared between the two cohorts over the interval.

Results: Data was available for 39 subjects to be included in either cohort; the majority of values were calculated as a percentage prior to mmol/mol becoming the standard unit of HbA1c. The cohort maintained on MDI therapy throughout the study period (n=20) had a mean rise in HbA1c of 0.13% (95% confidence interval -0.43% - 0.69%). The cohort which was switched from MDI to pump therapy had a mean rise in HbA1c of 0.54% (95% confidence interval 0.03% - 1.05%).

Conclusion: There is a trend for worsening HbA1c throughout both groups. Although not statistically significant in this study, there seems to be a tendency for this to be more pronounced in the group switched to pump therapy than those who remained on MDI. Our study did not support the evidence from previous randomised control trials that SCII therapy generally results in improvements in HbA1c amongst a paediatric population with type 1 diabetes.
Serum Hepcidin as a Potential Mediator of the Disrupted Iron Metabolism in Obese Adolescents

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Background: The prevalence of obesity continues to rise in both developed and developing nations. An association between iron status and obesity has been described in children and adults. Findings from recent reports suggest that body mass index and inflammation predict iron absorption and affect the response to iron fortification; a relationship that may be mediated by hepcidin.

Aim of the work: The aim of this work was to determine iron status in obese adolescents. It aimed also to study the relation between serum hepcidin level and both iron as well as high sensitive CRP status in obese adolescents.

Subjects and Methods: this work was conducted on 80 adolescents aging 12-14 years old, divided into two groups; obese and non-obese. All children were subjected to full medical history taking, dietetic history, anthropometric measurements, determination of haemoglobin, serum iron, total iron binding capacity, transferrin saturation and serum ferritin, soluble serum transferrin receptor, hs- C-reactive protein and serum hepcidin.

Results: Cases showed significantly lower levels of haemoglobin, serum iron, serum ferritin and transferrin saturation when compared to control group. Significant higher diastolic blood pressure, higher mean TIBC , sTfR, serum hepcidin and hs–CRP were also found. Serum hepcidin level correlated positively with BMI and hs- CRP, but negatively with iron level in obese group.

Conclusion: Results of the present study appear to strengthen the hypothesis that obesity, as a low grade inflammation state, stimulates the production of many inflammatory markers such as CRP which can up-regulate hepcidin synthesis by adipocytes. As a result, increased hepcidin levels may lead to poor iron status in obesity.
Objective: To determine the relationship between body compositions, fat distribution and blood lipid profile in obese school children aged 7 to 18 years.

Methodology: In this cross-sectional study, 150 pupils between the ages of 7 to 18 years were included. Anthropometric measures of adiposity (BMI, waist circumference, waist-to-hip ratio, peripheral adiposity: as the sum of triceps and biceps skinfold thickness, central adiposity: as the sum of sub scapular, suprailiac and abdominal skinfold thickness), body composition and serum total lipids profile were assessed.

Results: There are significant sex differences in ages 7 - 18 years regarding BMI, abdominal skinfold thickness and TC/ HDL-C, and in peripheral adiposity at young age (7-11 years) and central one at adolescents (12-18 years). Body composition and fat distribution showed significant sex differences in adolescent period only; and in fat distribution in young age period. For young age, triglycerides and HDL-C are correlated to most of the body composition and anthropometric parameters in boys and not in girls. For adolescents, there is no correlation between any one of the lipid profile and the body composition and anthropometric parameters in either gender.

Conclusion: This study has shown that in comparison to girls, the correlation of body composition, fat distribution and lipid profiles were higher in boys aged 7 – 11 years only, with a tendency to develop the higher risk level of cardio vascular disease. Particular attention should be focused on the time prevention of childhood obesity.
Pediatric Metabolic Syndrome (MS) has been reported to predict adult MS. It has been suggested that the burden of MS is growing in young populations, especially in developing regions.

Objective: Assessment of the prevalence of MS and other metabolic features (i.e. hypertension, impaired fasting glucose, hyperinsulinaemia, insulin resistance and dyslipidaemia) among obese school students. Methods: This study included 462 (174 boys and 288 girls) Egyptian school students suffering from obesity (body mass index ≥95th percentile). Their age ranged between 7 and 18 years (their mean age was 13.43 ± 2.65 years). Clinical, anthropometric, pubertal (Tanner stages) and laboratory assessments were done to all cases. Diagnosis of MS was attempted using modified WHO criteria adapted for children (1999).

Results: Prevalence of obesity among 5798 students was 8.0% (6.6% in boys and 9.2% in girls), while 11% were overweight (9.2% in boys and 12.6% in girls). Prepubertal students represented 26.4% and pubertal 73.6%. Cases that were diagnosed as having MS represented 39.7% of the whole percentage of cases. The incidence rate among prepubertal students (45.5%) was higher than among pubertal ones (37%) (P 0.001). Prevalence of MS was higher in girls than boys in pubertal group, while boys have the higher prevalence in prepubertal age. Hypertension was significantly higher in pubertal (22.3%) than in prepubertal group (14.8%) (P 0.000). Prevalence of hyperinsulinaemia in prepubertal group (13.6%) was significantly higher than in pubertal group (3.3%) (P 0.001). However, prevalence of impaired fasting glucose (25.0%) and insulin resistance HOMA-IR (22.8%) in pubertal group was significantly higher than prepubertal group (20.5% and 13.6% respectively) (P 0.01). Dyslipidaemia in prepubertal group was 93.2% and in pubertal group was 91.3% with significant differences (P 0.000).

Conclusions: Prevalence of MS in the studied sample was higher in prepubertal than pubertal students and in girls more than boys.