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Diagnostic Evaluation and Comorbidity Screening for Polycystic Ovary Syndrome in Adolescents: Does it Differ Across Sub-specialities?
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Purpose: Polycystic Ovary Syndrome (PCOS) is a diagnosis that can have significant long term health implications. Forty to 85% of adolescents with PCOS are overweight or obese and > 60% have at least one component of metabolic syndrome. The diagnostic criteria for PCOS in adolescents have been subject to much debate. There are no consensus guidelines regarding comorbidity screening. This leads to considerable practice variability between providers and among specialties. Lack of sufficient evaluation risks underdiagnoses and unnecessary tests add to the cost of care. The purpose of this project was to evaluate and characterize this practice heterogeneity.

Methods: Retrospective chart review of a random sample of 103 electronic medical records of adolescent girls (11 – 21 years) who presented to the adolescent medicine (AM), pediatric endocrinology (ENDO) and gynecology (GYN) clinics at a large children’s hospital over a 1 year period (2011-2012), with visit diagnosis codes of PCOS, menstrual cycle disorders or hirsutism was performed. Patients diagnosed with a non-PCOS cause for symptoms were excluded. Data abstracted included details on age, age at menarche, symptoms, BMI, BMI percentile, examination findings, laboratory tests ordered and management plan. The evaluations performed were compared across specialties using Chi -square, Fischer exact and Kruskal-Wallis test, as appropriate.

Results: Fifty-seven patients (18 AM, 20 GYN and 19 ENDO) were eligible for the study. Baseline characteristics including age, reproductive age, age at menarche, menstrual symptom and presence of overweight or obesity were similar across the clinics. The proportion of patients who received LH, FSH, testosterone, prolactin and TSH testing were also similar. As compared to patients in GYN and ENDO, AM patients were less likely to be tested for levels of DHEA-sulfate (95 and 75%, respectively vs. 33%, p <0.001) and 17 hydroxy progesterone (90 and 78%, respectively vs.11%, p <0.001). They were also less likely to receive a pelvic ultrasound (95% in GYN and 47% in ENDO vs. 11% in AM, p<0.05). Thirty percent of patients with BMI in the overweight and obese range were not identified. Girls in AM and ENDO were more likely to be identified as having elevated weight (92.8% and 100%, respectively vs. 16.7% in GYN, p <0.001), acanthosis nigricans (85.7% and 72.7%, respectively vs. 33.3%in GYN, p <0.001) and to receive advice or referrals for weight management (71.4% and 72.7%, respectively vs.16.7% in GYN p <0.001). Proportion of patients who received tests for dyslipidemia (51.4%), diabetes (56.7%) and liver enzyme derangement (54.1%) were not significantly different among clinics.

Conclusions: There is variability across specialties in evaluating adolescent PCOS with significant under evaluation of co-morbidities. The balance between cost and benefit needs to be considered. In order to
better identify and treat complications of PCOS, consensus amongst specialists is needed, with subsequent emphasis on dissemination and provider education.

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High School Sports Participation: Risk and Protective Factors for Early Adulthood Physical Activity and Obesity in a Representative Longitudinal Study
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Purpose: To determine the association between adolescent boys’ participation in high school sports (basketball, football, or both) and early adulthood by: (a) levels of physical activity and (b) obesity prevalence.

Methods: The data come from the in-school student questionnaire, the in-home student interview and the parent interview during multiple waves of the National Longitudinal Study of Adolescent Health (Add Health), a school-based study of the early life course. We examined the association of adolescent male obesity with participants in basketball and football (as well as students that reported participating in both sports and no sports). We confined the final analysis to 9,267 male adolescents with valid survey weights that had weight and activity data for at least one of the four survey waves during a 15-year period, Wave I in 1994-1995 to Wave IV in 2008-2009. Measures of BMI and physical activity were collected in every wave while the majority of demographic information was collected in the first two waves. Parent and household information (parental education, household structure, and family income) were also only collected during Wave I and II. We used questionnaire items to construct measurements of recreational sports, traditional sports and cardio are identical in Wave I and Wave II. These items are also identical between Wave III and Wave IV. The differences between the first two waves and the latter two waves are that activities are spread across a greater number of items.

Results: Boys playing no sports were less likely to participate in traditional sports or cardiovascular activity at waves 1, 2, and 3. By wave 4, there were no significant differences in activity based on sports participation in high school. Obesity prevalence was significantly greater at all waves for boys who played football in high school and lowest for boys who played basketball. Higher levels of activity were consistently associated with lower obesity prevalence. Activity was most protective for those who played football in high school, while obesity increased among those who played basketball or no sports regardless of activity levels.

Conclusions: High school sports participation had different effects on physical activity levels and the prevalence of obesity among young adult males. Unlike adolescents that played no sports or football exclusively, athletes that participated in basketball and football, or basketball exclusively experience a
lower prevalence of obesity in early adulthood. Orientation to physical activity played an important role in the increased levels of obesity as adolescents’ transitioned to young adulthood. Our findings suggest that as basketball players become less active in late adolescence, the prevalence of obesity in this group begins to mirror football players. Further research is needed to determine the reason for the decreased level of physical activity as basketball players reach early adulthood.

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154.

**Reported Sports Participation, Sex, and Obesity in a Nationally Representative Sample**

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**Purpose:** Participation in organized sports is thought to provide beneficial opportunities for physical activity among adolescents. Identifying demographic and weight status patterns of sports participation among youth is essential to developing effective obesity interventions. We sought to examine how sex and obesity relate to sport participation in a nationally representative sample of adolescents.

**Methods:** Adolescents 12-19 years from the National Health and Nutrition Examination Survey (NHANES,1999-2006) reported leisure activities over the last month and had measured height and weight. We used these reports to identify participation in the five most common male and female sports. We created mutually exclusive categories of the “most frequent” sport to maximize the likelihood that participation was part of a team, based on time spent playing the sport, level of activity, and number of occasions playing the sport. We used adjusted Wald tests to examine the differences in sports participation by demographics and prevalence of obesity (BMI=95%) by sport, for boys and girls separately.

**Results:** For girls, 52% participated in at least one of the five most common sports, compared to 71% of boys; participation declined from middle to high school for both genders. Running and basketball were the most common sports played by girls, while running, basketball, and football were most popular among boys. Overall, girls playing sports were no less likely to be obese than non-players; only runners had a significantly lower prevalence of obesity (11% vs. 17%, p<0.01). In contrast, the prevalence of obesity among boys who did not play sports was higher than those who did (23.6 vs. 16.6%, p<0.01). This was true for all sports, except football, whose players’ obesity rates did not differ from those not playing sports.

**Conclusions:** Our findings demonstrate that male and female adolescents who participate in organized sports have a lower prevalence of obesity than non-athletes or participants in other activities. However, the effect of organized sports participation on obesity for female adolescents is not significant except for...
running/track. Physicians who counsel parents and girls toward sports participation should recognize that while participation in sports may have significant benefits, the relationship between participation and healthy weight is not as clear, especially for girls. Physicians and policy-makers should consider the gender and type of sport played when recommending participation as an obesity prevention strategy, and focus on encouraging continued participation as adolescents age.

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155.

It’s Not You It’s Me: Association Between Maternal Perceptions of Responsibility for Adolescent’s Excess Weight and Pediatric Weight Management Program Attrition
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Purpose: Obese adolescents 15-17 years old are nearly 18 times as likely to become obese adults as their normal weight peers. Pediatric weight management programs have the unique opportunity to help adolescents achieve a healthy weight at this critical time in their life. However, such programs typically achieve only modest success in part due to problems with patient engagement and attrition. This research aims to explore possible associations between maternal perceptions of their responsibility for their adolescent’s excess weight and whether they join and remain in a multidisciplinary weight management program.

Methods: This retrospective study utilized survey data from obese adolescents (12-18 years old, BMI >= 95th percentile) who attended an initial visit in the Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program between March 2007 and July 2010. The following question on a pre-enrollment survey assessed maternal perceptions of responsibility: How much do you blame yourself for your child’s weight problem? Response options were 0-no blame, 1-little blame, 2-some blame, 3-lots of blame. For this analysis, we dichotomized responses into little responsibility(0 and 1) and lots of responsibility(2 and 3). To assess joining status, patients were assigned a 1 if they joined the program or a 0 if they did not join. Among those who joined, attrition was assessed as a binary variable where 1= patients who remained in the program for 3 months or longer and 0= patients who dropped out before 3 months. Responsibility, joining status and attrition were compared using bivariate analysis and multivariate regression modeling.

Results: Program participants (n=351) had a mean age of 14.4 years and a mean BMI of 41.8 kg/m2 at the start of the program. Only cases in which surveys were completed by the mother were included in this analysis (84%). No statistically significant associations were found between joining status and degree of responsibility(p=0.15). We found that a greater percentage of families with mothers who reported high levels of responsibility for their child’s excess weight stayed in the program for 3 months.
or longer when compared to families in which mothers endorsed little responsibility (72% vs. 35% respectively, p=0.03).

**Conclusions:** This study suggests a positive association between program attrition and mother’s perception of their responsibility for their adolescent’s excess weight. The reasons for this association are not known, but one possible explanation might be that feelings of responsibility motivate mothers to provide greater support for their child throughout the process of an intensive family focused program. Further work should explore the underlying causes for this association and whether there may be a benefit to assessing maternal perceptions of responsibility during the intake process.

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**156.**

**Determining the Prevalence of Abnormal Screening Laboratory Tests Among a Population of Overweight & Obese Adolescents**

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**Purpose:** Obesity is a growing epidemic in the adolescent population. Due to the nature of obesity, and its progression to medical complications, multiple professional medical organizations have recommended performing laboratory testing as part of the initial evaluation of obese adolescents. However, the vast majority of adolescents require only healthy lifestyle changes as their initial treatment. The purpose of this study was to determine the prevalence of abnormal laboratory values among obese adolescents and to assess their impact on initial treatment.

**Methods:** This study was a retrospective review of the evaluation of 110 consecutive overweight/obese adolescents enrolled in a weight management clinic. Classification of the adolescents as overweight or obese was based on patient BMI, as defined by the Centers for Disease Control & Prevention, with BMI between the 85th and 94th percentile being labeled overweight, and BMI at or above the 95th percentile being labeled obese. Demographic and laboratory data were collected from patient charts. Laboratory data included fasting or non-fasting values for Cholesterol, Low Density Lipoprotein (LDL), Serum Glucose, HbA1C, Thyroid Stimulating Hormone (TSH), Alanine Aminotransferase (ALT), Aspartate Aminotransferase (AST) and Triglyceride. Normal, borderline-abnormal and abnormal values of laboratory results were set based on accepted standard values with input from sub-specialist faculty at the Children’s Hospital. Basic statistical analysis included calculation of prevalence, and comparison of prevalence between genders(if relevant)using Fisher t test. The Institutional Review Board of the Health System approved the study.
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Results: Of the 110 adolescents, 96.4% met criteria for obesity. There were 52% males and 48% females; 42% were Non-Hispanic White, 31% African American and 22% Hispanic. Mean age was 14.0 years. Overall, 36.3% of subjects had completely normal laboratory profiles. Analysis of each laboratory category showed normal values for the following: Serum Glucose (99%), HbA1C (80%), Total Cholesterol (84.7%), Low Density Lipoprotein (86.3%), triglyceride (100%), AST (94.9%), ALT (90.7%), TSH (89.5%). The following had high abnormal lab values: Serum Glucose (1%), HbA1C (1%), T. Cholesterol (4%), LDL (4.2%), AST (1%), ALT (4.1%). The rest of the subjects had borderline abnormal values. Of the 110 individuals, 4 were referred to sub-specialists for additional evaluation and management: 1 to Gastroenterology for elevated transaminases, 1 to Cardiology for high cholesterol and 2 to Endocrinology for high HbA1C. These 4 subjects had pertinent findings on history and physical examination which included either polyuria/polydipsia, hypercholesterolemia in multiple young family members or psychotropic medication use, any of which might have prompted laboratory investigation. The management plan for all others (96.3%) was aimed at weight reduction by adopting healthy lifestyle changes.

Conclusions: The results of most screening laboratory tests recommended for obese adolescents do not alter their treatment plans. Therefore, a revision of these recommendations could reduce unnecessary tests and their resulting costs, without compromising the outcome of treating the majority of obese adolescents. Our initial results suggest that a more beneficial approach might be to focus primarily on weight control strategies. Additional laboratory testing could be considered if relevant to specific adolescents.

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