



Childhood Obesity Management at the 9-11 Year Well Child Check – An Opportunity for Expert Committee Recommended Comorbidity Screening

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Abstract

Our study assessed how primary care providers in a large outpatient network follow ECR guidelines with regards to laboratory screening for co-morbidities of obese patients in the 9 to 11 year age group. This retrospective cohort study included 706 patients seen in an outpatient network with a 10 year well child check from 7/1/17 to 7/1/18 and a BMI greater than or equal to the 95th percentile. Our study found 42% of patients, who met ECR guidelines, had no lipid screening or obesity co-morbidity screening obtained. The most frequently abnormal test was the lipid panel, at 23%, and notably 16 % of Hemoglobin A1C screening resulted pre-diabetic range. Our study serves as an updated review of ECR compliance in a large primary care network and suggests an opportunity to enhance education on screening recommendations.

Keywords: Obesity; Expert committee; Lipid; Comorbidities; Screening

Introduction

Obesity affects 17% of children in the United States [1]. The most recent expert committee recommendations (ECR) in 2007 endorse a fasting glucose, lipid panel, aminotransferase (ALT), and aspartate transaminase (AST) levels every two years, starting at 10 years, for obese patients, defined as BMI at or above the 95th percentile [2]. In 2011 the National Heart, Lung, and Blood Institute (NHLBI) of Pediatrics issued guidelines endorsing universal lipid screening in ages 9 to 11 [3]. Thus, the 9-11 year well child check is a critical timepoint for pediatricians to identify obese children and order the appropriate comorbidity screening.

While the vast majority of physicians are aware of the ECR guidelines, a 2018 study found only 3.5% of children aged 9 to 11 years had a lipid panel at their well child visit with 43% of those resulting as abnormal [4,5,7]. Hyperlipidemia screening increased slightly from 17.1% to 20.1% after the NHLBI's guidelines were issued, and for overweight children, a lipid panel (57%) was the most common test ordered, followed by glucose (30%) [8,9].

A 2019 study demonstrated the significance of comorbidity screening when they found 28% of 6-year old children with

obesity showed signs of insulin resistance and 8% had elevated triglycerides [10]. Prevalence of pediatric non-alcoholic fatty liver disease (NAFLD) is reported to be 9.6%, with higher rates seen in obese children at 38% [11]. Addressing obesity in pediatrics is critical as children with obesity are 5 times more likely to be obese adults [12,13].

The last review of obesity co-morbidity screening compliance in a large primary care network was in 2018 assessing lipid screening compliance after the release of the 2011 ECR guidelines, which concluded clinicians rarely followed guidelines for universal lipid screening. Our study adds a broader scope of obesity co-morbidity screening tests, lacking in the current literature, to include fasting glucose, ALT, and AST level for obese patients in addition to lipid screening.

Materials and Methods

This retrospective cohort study included 706 patients seen in the Akron Children's Hospital Pediatrics (ACHP) outpatient network. The ACHP network is a large, hospital-owned outpatient network consisting of more than 30 offices where 115,385 children were seen for well visits in 2018. Inclusion criteria involved patients with a 10 year well child check from 7/1/17 to 7/1/18 with a BMI greater than or equal to the 95th percentile. Study variables abstracted from the medical record included medical record number, gender, race, insurance, BMI and date of 10 year well child check. Chart review was done to interpret laboratory test results including glucose, lipid panel, AST, ALT, and hemoglobin A1C levels at either the 9, 10 or 11 year well child check. Laboratory test results were interpreted as abnormal based on the criteria below (Table 1). Laboratory testing was counted as ordered at the well check if the patient obtained obesity comorbidity screening during a separate primary care provider appointment specifically for abnormal weight gain or as part of a referral visit to endocrinology or the healthy active living clinic in our institution. Glucose, lipid panel, AST, ALT, and hemoglobin A1C levels were not counted as ordered during the

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Table 1: Description of laboratory test variable ranges defined as abnormal.

Abnormal laboratory values	Laboratory Test Abnormal Range
Glucose	>99 mg/dL
Cholesterol	>199 mg/dL
Triglycerides	>129 mg/dL
HDL	<40 mg/dL
LDL	>129 mg/dL
AST	>37 U/L
ALT	>41 U/L
Hemoglobin A1c	5.7-6.4% Prediabetic, > 6.4% Diabetic

well check if the patient obtained these laboratory tests as part of a sick visit, ED visit, or outside of the 9 to 11-year age range.

Results

Study population

The majority of the study population was Caucasian (69%) and male (57%). Within the study parameters of patients with BMI greater than or equal to the 95th percentile, a large portion of 10 year old children were morbidly obese with majority of the study population having a BMI above the 98th percentile. Retrospectively, these children’s BMI at their 9 and 11 year well

child checks were consistently obese; 43% with BMI greater than or equal to 95th percentile at their 9 year well child visit and 50% with BMI greater than or equal to 95th percentile at their 11 year well child visit (Table 2).

Obesity comorbidity screening compliance and results

Though 42% of patients in our study had no lipid screening or obesity co-morbidity screening obtained during their well child visit, nearly 38% of patients did have all of their obesity comorbidity screening obtained at the time of their lipid screen. Nearly 10% of patients had a partial obesity co-morbidity screen at the time of their lipid screen and another 10% of patient had no co-morbidity screening at the time of their lipid screen (Table 3).

Of the obesity co-morbidity screening laboratory tests ordered, the most commonly ordered test was the lipid panel (57%), followed by HgA1C (52%), ALT (46%), AST (45%), and glucose (43%). The most commonly abnormal test was the lipid panel at 23%. Notably, the HgA1C resulted in the pre-diabetic range for nearly 16% of tests. (Table 4).

Well Check Compliance

Of the children in our study with a BMI \geq 95th percentile who attended their scheduled well child check, 27% of these children had not attended either their 9 or 11 year well child visit.

Table 2: Demographics and clinical characteristics of the study population.

Demographics, n =706.		n	%
Gender			
	Male	405	57.40
	Female	301	42.60
Race			
	White or Caucasian	493	69.83
	African American/Black	130	18.41
	Hispanic	24	3.40
	Other	24	3.40
	Asian	19	2.69
	Unknown	10	1.42
	Middle Eastern Indian	4	0.57
	Native Hawaiian and Other Pacific Islander	2	0.28
9 yr visit BMI			
	\geq 95%	305	43.20
	<95%	47	6.66
	NA (no visit)	354	50.14
10 yr visit BMI			
	95 \leq BMI < 95.9	85	12.00
	96 \leq BMI < 96.9	109	15.40
	97 \leq BMI < 97.9	138	19.60
	98 < BMI \leq 98.9	198	28.10
11 yr visit BMI			
	BMI \geq 99	176	24.90
	\geq 95%	356	50.42
	<95%	36	5.10
	NA (no visit)	314	44.48



Table 3: ACHP network ECR obesity comorbidity screening compliance at time of lipid screening.

Obesity comorbidity screening		
	n	%
All obesity comorbidity screening ordered at time of lipid screen	267	37.82
Partial obesity comorbidity screening ordered at time of lipid screen	69	9.77
No obesity comorbidity screening ordered at time of lipid screen	70	9.92
No lipid screening or comorbidity screening obtained	300	42.49

Table 4: Rates of obesity comorbidity screening compliance by laboratory test with associated results, if collected.

Obesity Comorbidity Screening Laboratory Test Results						
Laboratory Test	Test Ordered		Test Abnormal		Test Ordered and Not collected	
	n	%	n	%	n	%
Glucose	306	43.30	41	5.80	81	11.50
Lipid Panel	406	57.50	168	23.80	86	12.20
AST	320	45.30	20	11.60	82	11.60
ALT	327	46.30	30	4.30	71	11.50
HgA1C	336	52.40	47	0.90 Abnormal, 15.9 Prediabetic	77	10.90

Table 5: Well child visit compliance rates at 9 and 11 year well child visits for obese 10 year old patients with documented 10 year well check checks

Age 9 and 11 year well child check compliance		
	n	%
No documented 9 year Well Check	354	50.1
No documented 11 year Well Check	314	44.5
No documented 9 or 11 year Well Check	194	27.5

Additionally, 50% of patients did not attend their 9 year well child visit, but did attend their 11 year well child visit. Similarly, 44% did not attend their 11 year well check, but did attend their 9 year well child visit. (Table 5).

Discussion

Only 37% of obese patients in the ACHP network received all of the ECR recommended obesity comorbidity screening during their 9 to 11 year well visits, consistent with current literature ranging from 3.5 to 57% [4-8]. Conversely, 42% of obese patients did not receive any of the ECR recommended obesity comorbidity screening. Poor comorbidity screening despite provider awareness suggests there are barriers to testing including lack of knowledge of current guidelines, provider or parental perceived utility, hesitation to obtain laboratory work on children, and patients being lost to follow up. Prior studies have shown that providers doubt their obesity management efficacy and report time constraints which may lead to reduced screening [14-16]. Adversely, parents identify the clinic as their preferred setting to address weight, and adolescents are more likely to attempt weight loss when counseled by their physician [17,18].

While providers may not perceive co-morbidity screening to be efficacious, 23% of the obtained lipid panels were abnormal and 16% of the screening HgA1C were abnormal. This data showed the relevance of obesity co-morbidity screening and

the opportunity providers have to identify hyperlipidemia and insulin resistance in the pediatric population and intervene.

Identifying obesity co-morbidities on laboratory screening early in the disease course is a critical time to address lifestyle modification to prevent chronic disease, which is the utility of screening to convey to parents. Additionally, our study showed that the vast majority of parents are compliant with obtaining the laboratory tests if ordered by a provider.

Another finding of our study was that a large portion of our preadolescent population is being lost to follow up, with 27% without a 9 or 11 year well child check. This further emphasizes the importance of obtaining the recommended obesity comorbidity screening when a child is seen and to avoid waiting until the next well check as there may be fewer opportunities to obtain these screening tests in this age group.

The strengths of this study include a large patient population within a large hospital- owned outpatient network, including a large sample of providers, which increases the validity of this study. Limitations of this study include the use of various laboratory centers with various levels of validity and accuracy and the inability to identify if patients were fasting when laboratory tests were obtained, potentially leading to a Type I error, impacting interpretation of the data as falsely abnormal. Additionally, our predominantly Caucasian population limits the generalizability of our study.



Conclusion

This study serves as an updated review of ECR compliance in a large primary care network and suggests an opportunity to enhance provider education on the importance of the obesity comorbidity screening recommendations. This study can serve as a framework for future quality improvement initiatives.

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