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Research Article

Overweight and Chronic Constipation in Pediatric Primary Care Setting

Sudipta Misra MD*

Clinical Professor of Pediatrics, Brody School of Medicine, Greenville, NC, USA

***Corresponding Author:** Sudipta Misra, Clinical Professor of Pediatrics, 600 Moye Boulvard, Greenville, NC, USA Tel: 252 744 4963; E-mail: misras@ecu.edu

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Abstract

Aims: To explore the relationship between increased body mass index (BMI) and constipation in the primarycaresettings.

Methods: Retrospective chart review of two groups of children (5 to 18 years) from primary care clinic. Selection criteria were Group- 1: Consecutive children seen for general pediatric care, charts reviewed for incidences of overweight (BMI >85th percentile), constipation and overweight recognition. Group- 2: Children with constipation identified by ICD-9 code and reviewed for prevalence of overweight and referral to subspecialty clinic.

Results: Group- 1: Three hundred nineteen (33.4%) of the 955 children were overweight and 28 (2.93%) had constipation. The prevalence of constipation was not increased among overweight children. Group- 2 : Twenty four of the 66 children with constipation were referred to the pediatric gastroenterology clinic. Overweight children were 3 times more likely to be referred (n=20, p=.04). The two groups were mostly comparable including prevalence of overweight children (Group 1 33.4%; Group 2 30.3%).

Conclusion: Constipationwasnot associated with increased BMI in the primary care setting. However, overweight children with constipation were preferentially referred from the primarycaresettingtosubspecialtyclinicforfurthermanagement. Treating constipation in overweight children may be challenging in both primary care and subspecialty settings.

Keywords: Constipation; Children; Overweight; Obesity; Body mass index

Introduction

Constipation is not generally regarded as a gastrointestinal complication of obesity. Only one study in adults has reported such an association [1]. However, it can severely affect the quality of life in children [2]. Identification of overweight as a risk factor for constipation may facilitate early detection and treatment; potentially improving the quality of life of these children. Recently, we and others have reported an association between constipation and increased body mass index (BMI) in children [3-5]. However, these studies drew subjects mostly from the subspecialty clinics where children with resistant constipation or morbid obesity were referred for further management. We argued that these study populations might not have been representative of the pediatric population in general [3]. We have also observed that overweight children with constipation were more difficult to treat in subspecialty clinic setting [3]. This raises the possibility that the reported association between overweight and constipation might have been due to preferential referral of treatment resistant overweight children from the primary care clinic. This retrospective study was designed to test these hypotheses.

Methods

Study design

This study was designed to determine a. the prevalence and association between constipation and obesity is children in a primary pediatric care clinic and b. To determine the effect of BMI on referral pattern of children with constipation from the primary care to the subspecialty clinic. We reviewed charts of children seen for general pediatric care. As prevalence of constipation was low, we used ICD 9 codes to identify children with constipation in the same practice to have an adequate sample size to address the second objective. This allowed us to include children seen over a longer time period without going through each individual chart. So, two

independent but overlapping chart reviews were done on patients from an academic pediatric primary care clinic. The investigators could not identify and match up individual subjects across the two reviews due to Institutional Review Board patient confidentiality rules. The diagnosis of constipation was made by the primary care physician based on history of painful, difficult defecations and infrequent and/or hard stools.

Group -1 (The prevalence group), (Figure 1)

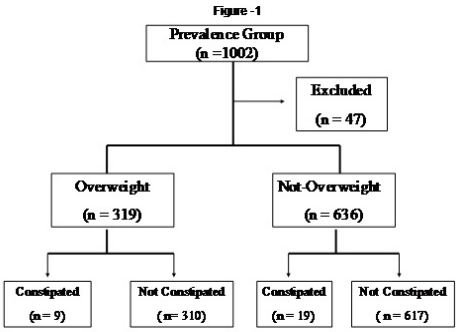

Figure 1: Constipation and Overweight in Primary Care Setting by Chart Review (Group-1)

Inclusion criteria: Children between the ages of 5 and 18 seen at the primary care clinic between 2003 and 2004. Charts of children were reviewed for anthropometric data and diagnosis of constipation. We also noted whether overweight was identified as a problem by the treating physician in children with BMI exceeding 85th percentile for age and sex.

Group-2 (The constipation group), (Figure 2)

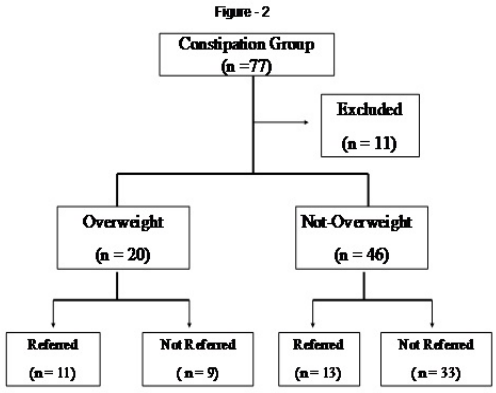

Figure 2: Children with Constipation in Primary Care Setting by ICD-9 Code review (Group-2)

Inclusion criteria: Children between the ages of 5 and 18 diagnosed as constipation by ICD 9 codes at the primary care clinic between 1999 and 2004. These charts were reviewed for height, weight, clinical data and referral to pediatric gastroenterology clinic.

Exclusion criteria for both groups

Children with known organic causes of constipation such as Hirschsprung's disease, other anorectal anatomical abnormalities, past history of anorectal surgery, cerebral palsy, pseudo-obstruction and chronic illnesses that can affect growth such as renal diseases, cystic fibrosis, hypothyroidism etc. were excluded from analysis in both the groups.

Assessment of Body Mass Index

BMIs of all children were calculated (BMI = weight in kg divided by height in meters squared) and plotted on the appropriate 2000 National Institutes of Health (NIH) growth chart.

Overweight was defined as BMI above the 85th percentile for age and sex on NIH chart.

Chi-square test and odds ratio determination were used for statistical analysis. A p value of less than .05 was considered to be statistically significant.

This study was approved by the Peoria Area Community Institutional Review Board of the University of Illinois at Chicago College of Medicine at Peoria.

Results

Group -1 (Figure 1)

Forty-seven of the 1002 charts reviewed were excluded per exclusion criteria. Twenty-eight (2.93%) children in the prevalence group (n = 955) had constipation and 319 (33.4%) were overweight. Overweight was identified as a problem in 50 of the 319 overweight children (15.7%). The prevalence of constipation in overweight children (9 out of 319, 2.8%) was not different from children who were not overweight (19 out of 636, 2.98%, p>.05). Similarly, 9 of 28 constipated children (32.1%) and 310 of 927 children without constipation (33.4%) were overweight. This difference was not statistically significant (p>.05). Redefining children with BMI >95th percentile for age and sex (n=183, 19.2%) as overweight and reanalyzing the data did not lead to different conclusions.

Group -2 (Figure 2)

Seventy-seven children were identified by ICD code review. Eleven were excluded per exclusion criteria. Twenty of 66 children in this group were overweight. Twenty-four children were referred to the pediatric gastroenterology clinic for further management of constipation. Eleven of the 24 who were referred to the subspecialty clinic and 9 of the 42 children who were not referred had BMI above the 85th percentile (Figure - 2). the odds ratio for an overweight child to be referred to subspecialty clinic compared to his non-overweight peers was 3.1 (95% CI 1.04 to 9.22, p=0.04).

Overweight children with constipation were slightly younger than their peers, but the difference was not statistically significant (8.79 + 2.75, 95% CI 7.5 to 10.07 and 10.08 + 3.8 years, 95% CI 8.95 to 11.21 respectively, p>.05). Thirteen of the 20 (65%) children in overweight group and 25 of the 46 (54.3%) non-overweight children were males (p>.05).

Comparison between two groups (Figures 1 and 2)

The incidences of constipation diagnosed at this primary care practice were comparable between 2 groups (14 patients/ year by direct chart review in Group- 1 and 12.8 patients/ year by ICD 9 code review in Group- 2). Children in the Group- 2 were younger than those in the Group- 1 (mean age 9.68 + 3.55 years; 95% CI 8.8 to 10.56 years, and 12.54 + 3.17 years (95% CI 12.36 to 12.72 respectively, p <0.01). Otherwise the groups were comparable. Thirty-seven (56.1%) children in the Group- 2 and 592 (49.2%) in the Group- 1 were males (p>.05). Three hundred and nineteen (33.4%) children in the Group- 1 and 20 (30.3%) children in the Group- 2 were overweight. BMIs in 240 children in the Group- 1 (20%) and 14 (21.2%) in the Group- 2 exceeded 95th percentile for age and sex. These differences were not statistically significant (p>.05).

Discussion

A relationship between increased BMI and constipation has been postulated based on similarity of psychological profile as well as on dietary habits, circulating hormones and hyperglycemia [4, 6, 7]. Early recognition and appropriate management of constipation may lead to better quality of life. Hence, identification of overweight children as the 'at risk' population for constipation may have clinical relevance to the primary care physicians. Though three independent studies supported such an association in children, we felt that these conclusions cannot be extrapolated to the general pediatric population without verifying at a primary care setting [3-5]. Children seen in the primary care clinics may have a different clinical profile of constipation than those seen at the subspecialty clinic. This study was undertaken to address these unanswered questions.

We found no statistically significant increase in the prevalence of constipation among overweight children seen for general pediatric care (Group- 1) compared to rest of the group. The prevalence of children with increased BMI was similar between Group-1 (children seen for general pediatric care) and Group-2 (those diagnosed with constipation). Based on these findings, we surmised that there was no relationship between constipation and increased BMI in the primary care setting. This is in apparent contradiction to the conclusions of our previous report. However, we found that children diagnosed with constipation who were also overweight were about 3 times more likely to be referred to the pediatric gastroenterology clinic for further management of constipation. This referral pattern may explain the reported increased prevalence of overweight children at the subspecialty clinics [3-5]. These findings suggest that while overweight children in the primary care setting did not have an increased prevalence of constipation, they were more likely to be resistant to usual treatment modalities. We have observed similar treatment-resistance among overweight children at subspecialty clinic as well.[3]

The prevalence of constipation (2.83%) in our study was comparable to those reported from other primary care settings (3%) [8]. The prevalence of overweight children in our patient population was comparable to national data [9]. Overweight was grossly under recognized in our patient population. This confirms reported lack of awareness among primary care providers regarding screening children for overweight [10].

The possibility that some patients were not billed as constipation (and thereby not included in Group-2) and hence Groups 1 and 2 are not comparable can be raised. However, the rate of detection of constipation was comparable between the groups (14 children/ year in Group-1 and 12.8 children/ year in Group-2). This similarity between the 2 groups makes sampling bias of Group 2 less likely. We defined overweight as BMI > 85th percentile because these are children at risk for morbid obesity and should attract close attention for early intervention from primary care physicians. Re-defining overweight at BMI > 95th percentile did not change our conclusion.

This study suffers from expected deficiencies of a retrospective study. Unlike our previous report, there were no consistent diagnostic criteria for constipation and clinical data points were missing. However, this data may be closer to actual primary care clinical practice where rigorous criteria are rarely followed. In our series, constipation was a problem of clinical significance rather than asymptomatic cases being detected by questionnaire. Such data, including 'undefined' cases of constipation represents a significant amount of data on constipation, especially from primary care setting [11].

Conclusion

We conclude that though the prevalence of constipation in overweight children was not increased in the primary care setting, they were referred more frequently to subspecialty clinic for further management. This referral pattern may explain the reported association between overweight and constipation at the subspecialty clinics. Overweight children were grossly under recognized in our pediatric clinic. Primary care physicians should be aware of the increased possibility of encountering treatment resistant constipation in overweight children.

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