

EVALUATION OF VOIDING DYSFUNCTION IN OBESE CHILDREN

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Introduction

Obesity and being overweight in children and adolescents constitute a common and growing problem worldwide. The comorbidities of obesity in childhood and adolescence include abnormalities in the endocrine, cardiovascular, gastrointestinal, pulmonary, orthopedic, neurologic, dermatologic, and psychosocial systems, as well as functional limitations. Secondary complications are increasing with the increase in the prevalence of obesity. Lower urinary dysfunction (LUTD); which is characterized by functional alterations in the bladder filling and/or emptying phases in toilet-trained children with no urinary infection or any other obvious pathology such as neurological or anatomical abnormalities, has also been reported in obese children. Studies on the effect of obesity on the urinary system in children continue and are limited. In this study, it was aimed to evaluate the relationship between childhood obesity and LUTD with metabolic and anthropometric measures.

Subjects and methods

400 obese children between 6 and 18 years of age who had a body mass index ≥ 95 percentile were included in the study. Dysfunctional Voiding and Incontinence Scoring System (DVISS) questionnaire was administered. The children with a score of ≥ 9 were accepted as having lower urinary tract dysfunction. Patients with and without LUTD were compared in age, gender, anthropometric measurements, puberty, acanthosis nigricans, blood pressure, fasting blood glucose, fasting insulin and blood lipids, HOMA-IR, family history of LUTD, parents' age and educational status, number of siblings.

Results

LUTD was detected in 19% of obese children. The mean age of the group with LUTD was significantly smaller ($p < 0.05$). There was no significant difference in terms of gender. It was seen that the risk of LUTD was 2.1 times higher in those with mothers' voiding dysfunction and 3.1 times higher in those with a history of voiding dysfunction in children. There was no significant difference between mother and father educational status, sibling numbers. Weight SDS, BMI SDS, waist circumference, HOMA-IR values were higher in patients with LUTD. Acanthosis nigricans were detected more frequently in patients with LUTD ($P < 0.05$). A logistic regression model was done with the presence of LUTD as a dependent variable and acanthosis nigricans, BMI SDS, HOMA-IR, family history of LUTD as an independent variable. The presence of acanthosis nigricans was found to be an independent predictor of the presence of LUTD.

Table 1. Demographic and anthropometric data of study population

	Obese without LUTD (n=324)	Obese with LUTD (n=76)	P
	Mean \pm S.D	Mean \pm S.D	
Age (years)	11.1 \pm 2.99	10.29 \pm 2.84	0.03
Weight (kg)	67.43 \pm 22.06	64.04 \pm 21.53	0.185
Weight SDS	2.68 \pm 0.99	2.78 \pm 0.98	0.506
Height (cm)	150.12 \pm 15.08	146.84 \pm 14.43	0.086
Height SDS	0.6 \pm 1.38	0.77 \pm 1.12	0.327
BMI (kg/m ²)	29.04 \pm 5.37	28.88 \pm 5.75	0.548
BMI SDS	2.56 \pm 0.61	2.62 \pm 0.67	0.552
WC (cm)	92.81 \pm 13.88	90.83 \pm 13.92	0.137
Systolic Blood Pressure (mmHg)	116.09 \pm 14.96	111.51 \pm 18.62	0.027
Diastolic Blood Pressure (mmHg)	72.85 \pm 10.89	70.33 \pm 10.93	0.054
Mother's age (years)	38.39 \pm 5.71	37.51 \pm 5.48	0.391
Father's Age (years)	42 \pm 5.95	40.25 \pm 5.13	0.038

Table 2 Biochemical parameters of obese adolescents with and without LUTD

	Obese without LUTD (n=324)	Obese with LUTD (n=76)	p
	mean \pm S.D	mean \pm S.D	
Blood Glucose (mg/dL)	92.23 \pm 7.49	91.22 \pm 7	0.286
Insulin (mIU/mL)	21.2 \pm 14.11	23.44 \pm 19.1	0.907
HDL (mg/dL)	47.89 \pm 11.61	49.88 \pm 12.7	0.238
LDL (mg/dL)	88.98 \pm 24.61	90.42 \pm 22.18	0.639
TG (mg/dL)	114.78 \pm 58.67	117.2 \pm 49.02	0.368
Total cholesterol (mg/dL)	159.71 \pm 29.7	163.6 \pm 26.64	0.099
HOMA-IR	4.9 \pm 3.61	5.4 \pm 4.73	0.826

Table 3 Relationship between acanthosis nigricans and LUTD

		LUTD		Total (n=400)	p
		Absent (n=324)	Present (n=76)		
Acanthosis Nigricans	Present	95 (%29.32)	32 (%42.11)	127 (%31.75)	0.031
	Absent	229 (%70.68)	44 (%57.89)	273 (%68.25)	

Table 4. Independent variables in multiple regression analysis

Acanthosis Nigricans	Exp (B) OR(95%CI)	p
	1.753 (1.048-2.932)	0.032

Conclusion

There is an ever-extending body of literature that supports the notion that weight-related issues extend well beyond metabolic and psychological comorbidities. Obesity has been associated with overactive bladder symptoms in both the pediatric and the adult populations. The presence of acanthosis nigricans was found to increase risk of LUTD 1.75 times in obese children. LUTD is a common problem that should also be assessed in obese children and acanthosis nigricans is an important physical examination finding for LUTD.

