tors of obesity in 272 boys and 242 girls who were aged 3 to 5 years.

METHODS: Bioelectrical impedance analysis was used to calculate percentage fat mass (%FM) and FMI (fat mass/stature^2). Boys and girls were considered obese when %FM was ≥ 25 and ≥ 30, respectively. Cutoffs of BMI (weight/stature^2) and FMI were tested at 90th, 95th, and 97th percentiles.

RESULTS: There were strong, significant correlations between BMI or FMI and %FM, but there was no significant correlation between BMI or FMI and stature; therefore, both BMI and FMI are useful indexes to assess fatness and obesity. With the use of %FM as the criterion for obesity, however, the highest prevalence of obesity was found at the 90th percentile for both genders. BMI and FMI had high specificities and lower but variable sensitivities. FMI is associated with a level of sensitivity that is somewhat higher than that of BMI. Almost all children who were not obese were classified correctly, whereas many obese children were not correctly identified.

CONCLUSIONS: FMI is a specific indicator of childhood obesity, and at 90th percentile, it has moderately high sensitivity. BMI should be used with caution as an indicator of childhood obesity.

COMPARISON OF INTERNATIONAL OBESITY TASKFORCE CUTOFFS, CENTERS FOR DISEASE CONTROL AND PREVENTION GROWTH CHARTS, AND BODY MASS INDEX *Z*-SCORE VALUES IN THE PREVALENCE OF CHILDHOOD OBESITY: THE GREEK OBESITY AND LIFESTYLE STUDY

Submitted by Nikolaos Mantzouranis
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OBJECTIVE: Few epidemiologic studies have compared classification methods of childhood obesity. The aim of the Greek Obesity and Lifestyle Study (GOALS) was to assess the prevalence of childhood obesity by comparing 3 classification methods.

METHODS: The GOALS was conducted on a representative sample of 2056 students (1148 boys and 908 girls), aged to 13 years. Body mass and height were measured, and the BMI (kg/m^2) was calculated. The comparisons of obesity prevalence were based on International Obesity Taskforce (IOTF) cutoffs, Centers for Disease Control and Prevention (CDC) growth charts and BMI-for-age *z* scores (overweight ≥1 SD, obese ≥2 SD).

RESULTS: The higher prevalence of obesity (including overweight) in GOALS was found by using the CDC growth charts (37.6%), whereas the obesity prevalence classified according to the IOTF cutoffs was recorded 1% lower (36.6%). In relation to CDC and IOTF classifications, significant lower prevalence was reported when obesity was estimated as BMI-for-age *z* scores (15.2%). Adjusted by gender, the Analysis of variance results showed that the obesity prevalence was significantly higher in boys in both CDC and IOTF classifications compared with BMI-for-age *z* scores.

CONCLUSIONS: The comparison among studies in Greece shows that the prevalence of childhood obesity in GOALS, based on both IOTF and CDC classifications, is the highest ever recorded in Greece and almost similar with the obesity prevalence reported in US teenagers. The lower obesity prevalence recorded in GOALS using the BMI-for-age *z* scores, compared with IOTF and CDC classifications, did not appropriately specify childhood obesity and cannot be used for public health applications.

ASSOCIATION OF COMORBIDITY WITH OBESITY IN MEXICAN CHILDREN AND ADOLESCENTS

Submitted by Arturo Perea-Martinez
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INTRODUCTION: Obesity is a chronic and recurrent inflammatory disease, associated with high risk to health. It is a world public health problem that affects children and adolescents. It is present in rich and poor countries. Type 2 diabetes, systemic arterial hypertension, blood lipid disorders, and cardiovascular disease together compose the metabolic syndrome (BMI > 95th percentile, weight circumference ≥ 85th percentile, serum glucose ≥ 100 mg/dL, high-density lipoprotein cholesterol ≤ 40 mg/dL, serum triglycerides ≥ 110 mg/dL); orthopedic lesions and psychosocial problems (marginalization and depression) are present early in life in obese individuals.

OBJECTIVE: The objective of this study was to describe the frequency of comorbidity in a cohort of 185 obese Mexican children and adolescents.

METHODS: A total of 185 obese Mexican children and adolescents were included in the study. The following parameters were measured: BMI, serum lipid profile, serum glucose, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, and serum uric acid. Complete physical examinations were performed, including blood pressure measurements.

RESULTS: BMI was at the 95th percentile in 97% of cases; 75% had ≥1 clinical indicator of comorbidity associated with obesity. Skin lesions (nigricans acanthosis; folliculitis; and grooves in hip, abdomen, and upper and lower extremities), serum lipid disorders (high level of

serum triglycerides, low level of high-density lipoprotein cholesterol), systemic arterial hypertension, and others (eg, hypertransaminemia, hyperuricemia, orthopedic lesions) were the most common.

CONCLUSIONS: Obesity in children and adolescents is a severe world public health problem. Obese children and adolescents frequently had associated comorbidity. It is necessary to improve health, juridical, and educational world policies that prevent and support the treatment of obesity in early life.

THYROID FUNCTION AND GHRELIN AND LEPTIN LEVELS IN OBESE CHILDREN AND ADOLESCENTS WITH AND WITHOUT INSULIN RESISTANCE

Submitted by Charilaos Stylianou

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INTRODUCTION: Thyroid hormones ghrelin, leptin, and insulin are implicated in energy metabolism.

OBJECTIVE: The objective of this study was to investigate any relationship between thyroid function and ghrelin and leptin levels in selected euthyroid (thyrotropin: 0.35–4.94; free thyroxine [fT4]: 0.8–1.8; no autoimmune thyroiditis or iodine deficiency, no medications intake) obese children and adolescents with and without insulin resistance (IR).

METHODS: Forty obese children and 40 obese adolescents were enrolled. BMI, percentage of body fat, fasting glucose, insulin, ghrelin, leptin, thyrotropin, free triiodothyronine (fT3), and fT4 were measured. IR was estimated with homeostasis model assessment of IR index. The Mann-Whitney *U* test for independent samples was applied. Correlations were assessed by the Spearman coefficient.

RESULTS: In adolescents, fT3 levels were positively correlated with insulin and homeostasis model assessment of IR. In children, fT4 levels were negatively correlated with BMI and percentage of body fat (Table 1).

TABLE 1. Thyroid Function and Ghrelin and Leptin Levels in Obese Children and Adolescents With and Without Insulin Resistance

	Obese Children			Obese Adolescents		
	IR	NIR	*P*	IR	NIR	*P*
n	20	20		20	20	
BMI, kg/m^2	28.87 ± 3.84	27.11 ± 4.53	.121	30.54 ± 4.74	29.43 ± 3.87	.678
Body fat, %	35.68 ± 4.71	33.28 ± 4.98	.157	35.59 ± 6.01	34.33 ± 5.14	.461
Homeostasis model assessment, IR	5.00 ± 4.04	1.55 ± 0.64	.000	4.51 ± 1.53	1.80 ± 0.56	.000
Insulin, μIU/mL	22.53 ± 15.02	7.33 ± 2.64	.000	20.04 ± 5.76	9.01 ± 2.65	.000
Ghrelin, pmol/L	831.29 ± 379.19	902.96 ± 360.49	.355	860.12 ± 289.89	1102.09 ± 366.10	.043
Leptin, ng/mL	36.22 ± 14.94	35.20 ± 23.43	.301	42.31 ± 21.81	34.75 ± 17.93	.221
Thyrotropin, μIU/mL	2.28 ± 1.22	2.15 ± 0.75	.779	2.20 ± 1.15	2.06 ± 1.24	.659
fT3, pg/mL	4.61 ± 0.92	4.59 ± 0.64	.989	4.19 ± 0.68	4.12 ± 1.08	.529
fT4, ng/dL	1.32 ± 0.14	1.37 ± 0.22	.495	1.22 ± 0.12	1.29 ± 0.17	.398

CONCLUSIONS: The observed positive correlation between IR and fT3 in adolescents might indicate an interplay between thyroid function and IR. Ghrelin levels are negatively affected by IR but not directly associated with thyroid hormone concentrations.

Pediatric Research

ROLE OF NERVE GROWTH FACTOR IN ALLERGIC AND INFLAMMATORY LUNG DISEASES

Submitted by Basma Abdelmoez

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INTRODUCTION: Nerve growth factor (NGF) is a neurotrophin that exerts an important role in the development and functions of the central and peripheral nervous system, as it was originally discovered for its properties of simulating growth and differentiation of neurons; however, it was recently documented that several immune cells, such as mast cells, lymphocytes, and eosinophils, produce, store, and release NGF. Neurotrophins, including NGF, are constitutively expressed by resident lung cells and produced in increasing quantities by immune cells that invade the airways under inflammatory conditions. Furthermore, NGF appears as a promoter of allergic airway inflammation by increasing eosinophil and lymphocyte recruitment into the lungs. Neurotrophin receptors are expressed on several immune cells, including mast cells, T cells, B cells, and macrophages.

OBJECTIVE: The objective of this study was to clarify the role of NGF in allergic and inflammatory lung diseases.

METHODS: Our study was conducted of 90 children who attended the outpatient pediatric clinic or were admitted to the inpatient pediatric department of Elminia University Hospital. They were classified into 3 groups as follows: group 1, 35 children with asthma during the acute attack; group 2, 35 children with severe inflammatory lung disease and bronchopneumonia; group 3, 20 seemingly healthy children who were age and gender matched to the children with disease. For all children, the following were done: careful history taking, thorough clinical examination, chest radiograph,

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