FPIN's Clinical Inquiries

Secondary Causes of Obesity

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Clinical Inquiries provides answers to questions submitted by practicing family physicians to the Family Physicians Inquiries Network (FPIN). Members of the network select questions based on their relevance to family medicine. Answers are drawn from an approved set of evidence-based resources and undergo peer review. The strength of recommendations and the level of evidence for individual studies are rated using criteria developed by the Evidence-Based Medicine Working Group (http://www.cebm.net/?o=1025).

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Clinical Question

When is it appropriate to perform a workup for secondary causes of obesity?

Evidence-Based Answer

CHILDREN AND ADOLESCENTS

Secondary causes of obesity can be detected by obtaining a patient history and performing a physical examination. Laboratory testing is recommended when additional findings are present, such as dysmorphic features, short stature, slow growth velocity, delayed puberty, or clinical signs and symptoms of endocrine abnormalities (e.g., hirsutism, truncal obesity, violaceous striae). (Strength of recommendation [SOR]: C, based on expert opinion.) Underlying metabolic and genetic causes of obesity are uncommon. The small number of children with a secondary cause of obesity typically also have short stature. (SOR: C, based on a prospective cohort study.)

ADULTS

There is little evidence about secondary causes of obesity in adults. The evaluation for secondary causes of obesity should include a patient history and physical examination, with additional laboratory testing based on specific symptoms, risk factors, and index of suspicion. (SOR: C, based on expert opinion.) Because of the association between obesity and polycystic ovary syndrome (PCOS) in women, a detailed menstrual history and evaluation for hyperandrogenic symptoms is warranted. (SOR: C, based on case-control studies.) Hypothyroidism is associated with obesity, although a cause and effect relationship is not clearly established. Thyroid studies may be helpful to determine a diagnosis (SOR: C, based on case series.)

Evidence Summary

CHILDREN AND ADOLESCENTS

A prospective cohort study followed 1,405 children and adolescents four to 16 years of age who were obese, and who were referred to an endocrinology clinic for evaluation.[1] A syndromal or endocrinologic disorder was diagnosed as the cause of obesity in 13 patients (0.9 percent; number needed to refer = 108). A complete history, physical examination, and laboratory workup, including measurement of calcium, thyroid-stimulating hormone (TSH), insulin-like growth factor I, and cortisol levels, were performed in all patients. Those with elevated TSH levels were evaluated for thyroid disease, whereas those with clinical symptoms or delayed growth velocity were evaluated for Cushing syndrome and growth hormone deficiency. In patients with hypocalcemia, intact parathyroid hormone levels were measured to rule out pseudohypoparathyroidism. Patients with dysmorphic features suggestive of syndromal or chromosomal abnormalities were examined at a genetics clinic.

Of the 13 patients with an identifiable secondary cause of excess weight, three were overweight and 10 were obese; 11 were below the 10th percentile in height; and two had delayed puberty. All 13 patients had clinical findings, and none were identified solely based on laboratory test results.

The study authors recommended against general laboratory screening for secondary causes of obesity in children and adolescents, particularly because cortisol and TSH levels are commonly elevated in patients with obesity. The authors advised reserving laboratory testing for patients with short stature (which had the highest predictive value), developmental delay, dysmorphic features, or signs and symptoms of underlying endocrine abnormalities.

ADULTS

There are no large studies evaluating the likelihood of secondary causes of obesity in adults. Two case-control studies demonstrated an association between obesity and PCOS in women. One study compared the body mass indices of 401 women with PCOS between 20 and 41 years of age; 2,586 age-matched control patients taken from the National Health and Nutrition Examination Survey I between 1971 and 1975; and 106 women from a community obstetric practice. Women with PCOS had a significantly higher body mass index than those in the control group.[2] A second study examined the prevalence of PCOS in 113 women referred to an endocrinology clinic for dietary treatment of overweight or obesity. Women who were obese were more likely to have PCOS than lean women (28.3 versus 5.5 percent) in the general population.[3] The authors of both studies recommended obtaining a detailed menstrual history and asking about hyperandrogenic symptoms of PCOS in women who are overweight or obese.

Three case series found an increased prevalence of hypothyroidism in patients who are obese. One of the series evaluated 72 patients referred for weight loss surgery; 25 percent were found to have subclinical hypothyroidism as evidenced by elevated TSH levels with normal free thyroxine values. Investigators tracked TSH levels for one year and found an increase with weight gain and a decrease with weight loss, but there was no correlation between TSH levels and the degree of obesity or the amount of weight loss.[4] A second case series measured TSH levels in obese patients referred to a sleep clinic for evaluation of sleep apnea; 11.5 percent of patients received a diagnosis of subclinical hypothyroidism.[5] The authors concluded that subclinical hypothyroidism has a higher prevalence in patients with sleep apnea who are overweight or obese, and this diagnosis should prompt thyroid function evaluation. A third case series was conducted in India and analyzed TSH data from 450 patients from an obesity clinic. Hypothyroidism was present in 33 percent of patients, and subclinical hypothyroidism was present in 11 percent of patients.[6]

Recommendations from Others

The Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity support evaluation for rare causes of secondary obesity based on patient history and physical examination.[7] The committee recommends a workup for PCOS if there are infrequent menses, hirsutism, or excessive acne. Thyroid function tests are not necessary in children with normal linear growth and no other symptoms of hypothyroidism. Cushing syndrome should be considered in children with a buffalo hump, moon facies, striae, and short stature. Genetic conditions should be considered in children with dysmorphic features, short stature, or developmental delay.

A primer published by the American Medical Association states that specific evaluation for underlying causes of obesity in adults should be based on symptoms, risk factors, and index of suspicion. Symptoms such as moon facies, severe fatigue, striae, oligomenorrhea, and hirsutism should prompt additional workup.[8]

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