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Obesity Disorder and Methods of Treatment

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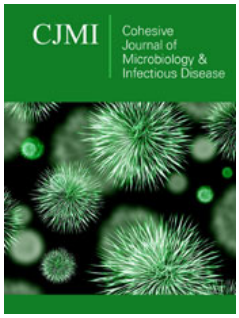

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Abstract

About 97 million adults in the United States are overweight or obese. Obesity and overweight substantially increase the risk of morbidity from hypertension; dyslipidemia; type 2 diabetes; coronary heart disease; stroke; gallbladder disease; osteoarthritis; sleep apnea and respiratory problems; and endometrial, breast, prostate, and colon cancers. Higher body weights are also associated with increases in all-cause mortality. The aim of this guideline is to provide useful advice on how to achieve weight reduction and maintenance of a lower body weight. It is also important to note that prevention of further weight gain can be a goal for some patients. Obesity is a chronic disease, and both the patient and the practitioner need to understand that successful treatment requires a life-long effort.

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Introduction

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health, leading to reduced life expectancy and/or increased health problems [1,2]. Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis [2]. Obesity is most caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications, or psychiatric illness. Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited. On average, obese people have greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass [3,4].

In the United States, data from the second National Health and Nutrition Examination Survey (NHANES II) were used to define obesity in adults as a BMI of 27.3kg/m^2 or more for women and 27.8kg/m^2 or more for men. These definitions were based on the gender-specific 85th-percentile values of BMI for persons 20 to 29 years of age. The WHO classification assigns an increasing risk for comorbid conditions-including hypertension, type 2 (non-insulin-dependent) diabetes mellitus, and cardiovascular disease-to persons with higher BMIs relative to persons of normal weight (i.e., those with a BMI between 18.5kg/m^{2}and 25kg/m^2. The WHO criteria for overweight are (BMI 25kg/m^2) and obesity (30kg/m^2), 67% of men and 62% of women are overweight [5].

Causes of obesity

At an individual level, a combination of excessive food energy intake and a lack of physical activity is thought to explain most cases of obesity [6]. A limited number of cases are due primarily to genetics, medical reasons, or psychiatric illness [7]. In contrast, increasing rates of obesity at a societal level are felt to be due to an easily accessible and palatable diet [8] increased reliance on cars, and mechanized manufacturing [9,10].

A 2006 review identified ten other possible contributors to the recent increase of obesity:

A. Insufficient sleep,

B. Endocrine disruptors (environmental pollutantsthat interfere with lipid metabolism),

C. Decreased variability in ambient temperature,

D. Decreased rates of smoking, because smoking suppresses appetite,

E. Increased use of medications that can cause weight gain (e.g., atypical antipsychotics),

F. Proportional increases in ethnic and age groups that tend to be heavier,

G. Pregnancy at a later age (which may cause susceptibility to obesity in children),

H. Epigeneticrisk factors passed on generationally.

I. Natural selection for higher BMI, and

J. Assortative mating leading to increased concentration of obesity risk factors (this would increase the number of obese people by increasing population variance in weight) [11].

While there is substantial evidence supporting the influence of these mechanisms on the increased prevalence of obesity, the evidence is still inconclusive, and the authors state that these are probably less influential than the ones discussed in the previous paragraph. Factor affecting obesity.

Genetic & environmental factors

Studies in twins and in adoptees and their families indicate that from 40% to as much as 80% of the variance of BMI can be attributed to genetic factors. It is estimated that heritability is as high as 30-40% for factors relevant to energy balance such as body fat distribution, resting metabolic rate, energy expenditure after overeating, lipoprotein lipase activity and basal rates of lipolysis [12]. The B3-adrenoceptor Decreased function of this gene could be associated with impairment of lipolysis in white fat or with thermogenesis in brown fat. A mutation of the gene has been found to be associated with abdominal obesity, insulin resistanceand early-onset type 2 diabetes in some subjects and a markedly increased propensity to gain weight in a separate group of morbidly obese subjects [12].

Endocrine & metabolic factors

Syndromes identified with the endocrine system only rarely cause obesity (Craddock,1973); those that do include Frohlich's syndrome and Cushing's syndrome. Althoughboth metabolic and endocrine factors rarely cause obesity, future research may findcomplex interactions between the endocrine and metabolic systems to be acontributing factor to the problem of obesity [13].The metabolic system determines the rate at which food is processed, stored, andburned up in the body. Problems in the metabolic system (e.g., deficiency of thethyroid gland) may slow the rate at which food is processed, and in some individuals,this leads to overweight. Suspected cases of metabolic disorders can be easily detectedthrough a simple clinical blood test performed by a physician. To reiterate, the number of cases in which obesity is caused by metabolic factors issmall. However, considering that varying builds contribute differentially to weightproblems, it is reasonable to assume that metabolic rate will differentially influence anindividual's propensity for obesity [13].

Food intake

Some patients eat more during periods of heavy exercise or during pregnancy and areunable to get back to their former eating habits. The increase in obesity can usually berelated to the type of food consumed (i.e., food containing sugar and fat). It has been shown that obese patients eat more than they admit to eating, and overthe years a very small daily excess can lead to a large accumulation of fat [14].

Energy expenditure & thermogenesis

Basal Metabolic Rate (BMR) in obese subjects is higher than in lean subjects, which isnot surprising since obesity is associated with an increase in lean body mass. Physical activity. Obese patients tend to expend more energy during physicalactivity as they have a larger mass to move. On the other hand, many obese patientsdecrease their amount of physical activity. The energy expended on walking at 3 milesper hour is only 15.5kJ/min (3.7kcal/min) and therefore increasing exercise playsonly a small part in losing weight. Nevertheless, because increased body fat developsinsidiously over many years, any change in energy balance is helpful. B3-Adrenergic receptors are the principal receptors mediating cate-cholamine stimulate lipolysis in brown adipose tissue and to a lesser extent at other sites. Drugswith B3-adrenergic activities have been developed, but side-effects have limited theiruse [15].

Treatment of obesity

Pharmacologic interventions: Pharmacotherapy is an option available for extremely obese (ie, body mass index [BMI] ≥2 units above the 95th percentile) children older than 12 years of age who have not responded to 1-year dietary and lifestyle treatments, as well as for those with impaired glucose tolerance or insulin resistance, steatohepatitis, ovarian hyperandrogenism, or a strong family history of diabetes, myocardial infarction, or stroke [16]. It has been demonstrated that a combination of medication and lifestyle modification decreases weight more than lifestyle change alone [17].

Drugs approved by the Food and Drug Administration (FDA) to treat obese adults include phentermine, phendimetrazine, benzenediamine, diethylpropion (appetite suppressants), and orlistat (intestinal lipase inhibitor); however, most clinicians prescribe orlistat. Furthermore, only orlistat is indicated for the treatment of overweight adolescents. It is approved by the FDA for the treatment of obesity in adolescents aged 12 years and older [18]. Until recently, sibutramine was widely used as an anti-obesity medication; however, it has been pulled off the market [19]. Other weight-lowering drugs for teenagers and children should only be used in the context of a controlled clinical trial.

Naturopathic medicine: Although the roots of Naturopathy trace back through Europe, modern Naturopathic Medicine was

formalized in 1896 by Benedict Lust, an American physician. Naturopathic Doctors (NDs) are graduates of accredited, four-year post-baccalaureate programs, trained in basic and clinical sciences as well as in a wide range of complementary treatment modalities. Regulation of ND practice varies widely in the US. Therefore, if referring to an ND for the purpose of holistic weight loss support, the nurse practitioner would be wise to recommend an ND certified by the North American Board of Naturopathic Examiners (NABNE) and graduated from a program recognized by the Council on Naturopathic Medicine (CNME). A list of qualified naturopathic physicians can be found at http://heartspring.net/naturopathic_directory.html.

NDs are trained as primary care providers and are recognized for clinical expertise and effectiveness in preventive care. NDs address the underlying causes of illness or disability by treating the whole person in a way that assists an individual's internal capacity for self-healing. NDs use a variety of treatment modalities, including herbal medicine, nutritional supplementation, physical medicine, homeopathy, lifestyle counseling, and mind-body therapies. Yet, it is their orientation toward holism and vitalism and not specific treatment modalities that unites the profession. Overall, the focus of Naturopathy is health promotion and wellbeing, not simply disease treatment [20].

Naturopathic treatment of obesity: Naturopathy considers obesity to be less about diet and more about correcting underlying imbalance through lifestyle change that requires a plan of care that supports long-term sustainable health optimization. Six foundational principles inform this plan and can be used to treat obesity.

Surgical treatment: Operations that involve by passing parts of the small intestine have fallen out of favor because of their side-effects and cannot be recommended. Jejune ileal bypass was the most common operation and involved the anastomosis of approximately 18cm of jejunum to the terminal 18cm of the ileum. Complications are chiefly those of intestinal resection. A fatty liver often occurs,and, in a few patients, cirrhosis is seen [21].

Phytotherapy: The use of natural products for medicinal purposes has been documented for hundredsof years. Many countries throughout the world are known for their traditionalmedicine, with China standing out as a country where people rely on traditionalmedicine as a form of health promotion and disease treatment in their day-to-day life.Western medicines have replaced some, but not all, Chinese herbsin medicinaltreatment. The main reason for this popularity is the belief that most herbal medicines, due to their "natural" origin, are harmless and without side-effects [22]. However, its popularity is also determined by the desire to find new solutions thereforeof the new information released by the mass media and industries [23]. Today, plants are the basis of many drugs used in modern medicine, with products such as digoxin, ergometrine, morphine,codeine, scopolamine, pilocarpine and many others, and pharmacological potential is continually being explored [22]. Herbs can play many safe and effective roles with obesity. Louise Tenney writes in "Today's Herbal Health", that "herbs help the body adjust as well as supply vitamins and minerals. This combination acts as a general body cleanser, regulates metabolism, dissolves fat in the body, helps eliminate craving for food, stimulates glandular secretions, reduces water retention, boosts energy, and helps in constipation [24,25].

Pharmacological Treatments

Pharmacotherapy has been proposed for adolescents with obesity who respond sub optimally to intensive multicomponent behavioral interventions and for those with impaired glucose tolerance, nonalcoholic steatohepatitis, ovarian hyperandrogenism or a family history of diabetes, myocardial infarction, or stroke [26,27]. However, options are extremely limited in the WHO European Region. Orlistat, a lipase inhibitor, is the only medication approved by the United States Food and Drug Administration (FDA) for long-term pediatric obesity treatment (≥12 years) and is not approved by the European Medicines Agency (EMA) [28,29]. Clinical use is believed to be limited because of the modest efficacy (~3% BMI reduction over 12 months) and adverse effects such as oily spotting and flatus with discharge. Other weight-loss medications with limited evidence of effectiveness include phentermine, a norepinephrine reuptake inhibitor which is also approved by the FDA but not the EMA [30].

The few high-quality studies of topiramate and recombinant growth hormone have not shown benefits for BMI reduction in children [20]. Several more recent high-quality studies have evaluated the effectiveness of liraglutide, a glucagon-like peptide-1 agonist used for adult T2DM, in children with genetic causes of obesity, adolescents with obesity and T2DM, and adolescents with obesity alone [29-31]. Recently, the EMA recommended the approval of liraglutide for the treatment of obesity in adolescents. No current evidence supports weight loss medication use as a monotherapy and clinicians prescribing these medications to adolescents should provide or refer to intensive behavioral support for patients and families as an adjunct to pharmacotherapy.

Conclusion

Obesity has been the most common type of malnutrition and one of the greatest with health hazards to life in the United States today, and it can be prevented (Diehl 120). The solution is as simple as eating the same amount--but with healthier choices and a lifelong diet, such as vegetarianism. Exercising is also important to keep fit and use up any extra calories from that ice cream at dessert. Nonetheless, some fat is essential for the body as heat, stored energy, insulation, and padding ("The Wholesome Diet" 64). No one cannot "cure" obesity by simply achieving a certain body weight. Eating healthy and keeping active is all a part of a lifelong daily routine (Whitney 273). No diet should be promoted as a temporary eating plan, but rather a permanent lifestyle for healthy eating. Moreover, Anti-obesity pharmacological treatment should be administered only when considered safe and effective for obese subject.It is recommended that future studies be required

to separate and purify the main components of anti-obesity plant extracts to find out the active constituents for treatment, suitable dose and suitable duration that can be used without other severe side effects.

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