

Efficacy of Cognitive Behavior Therapy and Pharmacotherapy on Adolescent Obesity

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Adolescent obesity is an urgent health issue in the U.S., and is a precursor to many physiological and psychological conditions. There are different treatment options for adolescent obesity, and it is important for the general public to understand the benefits and risks associated with the particular treatments. This paper focuses on two treatment options for adolescent obesity, cognitive behavioral therapy (CBT; type of psychological therapy) and Orlistat (medication for obesity), and discusses the effectiveness of each treatment for adolescent obesity. CBT focuses on the behaviors that are associated with the development and maintenance of obesity, while Orlistat targets the physiologic mechanisms of obesity. It appears that while both treatments may be effective for obesity, in general, CBT could help adolescents make lifestyle changes that are more beneficial in long-term mental and physical health. Additionally, when CBT is combined with Orlistat to initiate weight loss, which is then maintained by CBT alone, it could have the greater treatment effects.

Keywords: adolescent, obesity, cognitive behavioral therapy, Orlistat

Introduction

Adolescent obesity is prevalent in the U.S.¹ Similar to adult obesity, adolescents with obesity are at increased risk of developing other health conditions, such as high blood pressure, high cholesterol, type 2 diabetes, and heart disease.² Obesity is normally measured by body weight, height, and age, known as Body Mass Index (BMI).² Children with a BMI value that falls in or above the 95th percentile in their age group are considered obese.² Youth obesity prevalence was found to be 16.9% in a 2011-2012 statistical report published by the American Journal of Medicine.¹ This represents no significant change since the 2009-2010 statistical report.¹ However, there have been conflicting results in determining the trends of adolescents with obesity.¹ Regardless of these results, adolescent obesity remains a serious and important health issue in the U.S. that needs to be addressed.

In order to address the issue of adolescent obesity, which in turn would influence adulthood obesity, there are a number of different treatment options today, including psychotherapy, medications, and surgery. The Food and Drug Administration (FDA) currently approves only one prescription drug for the adolescent obesity known as Orlistat.³ Orlistat is different from an appetite suppressant because it inhibits the absorption of fats in the gastrointestinal tract by up to 30%.³ On the other hand, the goal of cognitive behavioral therapy (CBT) is to intervene and change a child's diet and activity levels, which can be accomplished by putting the child through either outpatient or immersion programs.⁴ The general public need to better understand the differences in the benefits and risks of CBT and the medication (i.e., Orlistat). The current paper discusses and compares the effectiveness of CBT and Orlistat for adolescent obesity. Since Orlistat is suggested to be used in conjunction with a behavioral intervention,³ our discussion here focuses on the efficacy of Orlistat with a behavioral intervention and CBT for weight loss in adolescents.

Literature Review

Obesity is a serious health issue that affects 16.9% of adolescents in the U.S.¹ Although the prevalence of adolescent obesity has not significantly changed in recent years,¹ adolescent obesity is still a major problem in the U.S. The Center for Disease Control (CDC) categorizes childhood obesity as a child with a BMI-for-age in the 95th percentile.² These children are considered obese, while another 16% of children in the US are in the 85th – 95th percentile for BMI-for-age, meaning they are overweight.² There are many factors that can cause adolescent obesity, making its treatment challenging.

Adolescent obesity can lead to coronary heart disease, stroke, type 2 diabetes, and adult obesity.^{5,2,6} In addition, short-term consequences of adolescent obesity include high blood pressure, high cholesterol, social alienation, lack of participation in childhood activities, and other emotional effects.^{2,6} It can be assumed that obesity affects adolescents physically, limiting their ability to participate in activities and keep up with peers. Obesity can also severely impact an adolescent's mental status.⁷ It can create academic and social difficulties, as well as deplete feelings of competence and self-worth.⁸ Obese adolescents are at risk of being teased, which can add to the cycle of obesity and depression.⁷

Obesity studies generally concentrate on adults rather than children and adolescents due to the higher prevalence of adult obesity. However, since childhood obesity can lead to adult obesity, a better approach to research studies involving the prevention and treatment of this condition may be to focus on adolescent obesity.⁹ Health risks and consequences of obesity increase dramatically, 2 to 6.5-fold, for children who are obese compared to those who are not.⁹ It must be considered that an adolescent's body varies extensively from an adult's; consequently the treatment cannot be applied for both age groups.¹⁰ Prior to adulthood, adolescents are growing and going through puberty, both of which should be considered when attempting to treat any adolescent issue.¹⁰ An example of this can be seen in the pharmacotherapy drugs offered for weight loss. The U.S. Food and Drug

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Administration (USFDA) typically create an age requirement for new medications. In the case of Orlistat, the age requirement is 12- 16.¹¹ For the purposes of our review, adolescents are defined in the age group of 12-16 years.

A less invasive treatment options for adolescent obesity are lifestyle interventions. They are often chosen as the first line of treatment.¹² Lifestyle interventions have two main components: diet and physical activity.¹² The basis behind these lifestyle interventions is behavioral therapy, and the effectiveness has been shown to be positive in multiple randomized controlled trials and meta-analyses.¹² A family's adherence and willingness to participate in weight loss programs are the main contributors to this positive effect.¹² Genetic and hormonal changes may play a role in issues with weight loss as unmodifiable factors.¹² In extreme cases of obesity in adolescents, lifestyle interventions may not be sufficient, and other options need to be considered.¹² Pharmacologic interventions for adolescent obesity should be considered when all non-pharmacologic treatment options have been unsuccessful for around 6 months, although there is no experimental data supporting the validity of this period of time.¹¹ The most intrusive form of treatment is surgery. Bariatric surgery is a last resort treatment option, however as with all surgery, risks and complications can occur.⁴ Surgery may be successful in the short-term, but no long-term effects of bariatric surgery on adolescent obesity have been studied.¹³ Cost and accessibility are issues that are often considered when choosing what type of treatment to utilize.⁴

Approved by the FDA in 2003, Orlistat is used in the treatment of adolescents from the age of 12-16, with obesity.³ Orlistat works as a fat absorption inhibitor that reduces the gastrointestinal absorption of fat by 30%, decreasing the amount of calories that the body absorbs.³ This differs from other pharmacotherapy drugs used for weight loss in that the others belong in the appetite suppressant subgroup.³ Orlistat is the only drug of its kind that is FDA approved as a caloric inhibitor.³ Orlistat was focused on in studies to treat adolescents because it has an isolated mechanism of action that is focuses specifically on the gastrointestinal tract.¹⁴ The common dosage of Orlistat for adolescents is 120 mg given three times a day.³ Like other weight loss drugs, it should be used with the other non-pharmacological methods of treatment such as behavioral interventions and a reduction in intake of fat from the diet.³

In a single study using Orlistat, a total of 97% of the participants had at least one minor side effect caused by the drug.¹⁴ The side effects were most often related to the gastrointestinal-tract.¹⁴ The remaining 3% of participants from the study developed a more serious side effect, gallstones.¹⁴ However, only one of these cases was possibly associated with Orlistat.¹⁴ Yet, Orlistat is considered a safe drug that simply contains moderate side effects such as abdominal discomfort, flatulence, and diarrhea, and it has been suggested that natural dietary fiber should be used with Orlistat to limit its adverse effects.³ In addition, the FDA recommends vitamin supplementation be used along with Orlistat because studies have shown reduced levels of fat-soluble vitamins among participants.³

Maahs et al.¹⁵ investigated the effects of Orlistat on weight loss in obese adolescents, using a randomized, double-blind, placebo-controlled trial. A total of 40 obese adolescents (mean BMI = 40 kg/m²) aged 14-18 years were randomly

assigned to either treatment (120 mg of oral Orlistat three times/day) or placebo group.¹⁵ After 6 months of the experiment, the investigators found no significant difference in BMI between the groups, while there was a significant decrease in BMI within each group.¹⁵ Side effects, such as gastrointestinal disturbances and forgetfulness, were reported from the Orlistat group.¹⁵ Hence, Orlistat, when used alone, may not be substantially effective for weight loss.

Another study looked at improvements in obese adolescents when Orlistat was used along side a 12-week behavioral program and a hypo caloric diet.¹⁶ The mean weight loss of these adolescents was 3.75 kg, which was less than the results involving adults, potentially because the subjects were still growing.¹⁶ Although there are some negative side effects of Orlistat use, there are also positive results in addition to the loss in weight and body mass index.¹⁶ For example, adolescents who had an obesity-related condition saw improvements in the cardiac risk factors such as total cholesterol and LDL cholesterol levels.¹⁶

One important consideration is that obesity is a chronic disease, thus the long-term effects of treatments are vital especially in growing children and adolescents. Many studies regarding Orlistat have been classified as short-duration, lasting only around 6-12 months.¹¹ Since the long-term efficacy of pharmacotherapy is unknown, there should be very high standards for its use in treating obesity. For those unable to lose weight through less invasive treatments such as behavioral therapy, the benefits of intensive pharmacotherapy will probably outweigh the risks, but more research should be developed to find the best medications for all cases of obesity.¹¹

Meanwhile, one of the non-invasive, long-term treatments of adolescent obesity is psychotherapy.¹⁷ Cognitive behavioral therapy (CBT), a type of psychotherapy, works to help adolescents change and improve their lifestyle, thought process, decision-making, and self-esteem.¹⁸ At this difficult age of adolescence, it is important to be cautious with behavioral therapy to ensure that it does not lead to other eating disorders, such as anorexia nervosa.¹⁸ In assessing long term effects, two follow up studies were done by re-assessing individuals 5 and 10 years after CBT was given to participants.¹⁸ Both follow ups showed significant weight loss; and after 10 years, 30% of the obese patients lost enough weight to be out of the obese category, and another 34% become 20% less overweight.¹⁹ Because there are many variables to account for during the adolescent years, the results of CBT can vary in that some studies have found a significant difference in weight for adolescents using CBT, while other studies have not.²⁰ Because of this inconsistency it may be necessary to redefine what goals these adolescents are attempting to reach.¹⁸ A realistic aim may be maintaining weight, instead of losing weight, which can be potentially frustrating for adolescents.¹⁸ However, as they grow their height, weight, and age will change and their previously overweight bodies will no longer be in the overweight or obese category.^{17,21,18} Another approach entails working to shorten the period of time it takes for weight loss to be significant.⁸ This is because if adolescents see results, they will be more inclined to continue the course of treatment and will become more invested in doing their best during the treatment process.⁸

CBT is not simply one type of treatment; rather, it comes in various types and can be used in conjunction with other types of treatment.⁴ The most common uses of CBT is in outpatient and immersion therapy studies.⁴ Outpatient CBT was found to reduce the percentage of overweight adolescents by 8.9% at the follow up study, and it has positive long-term effects as well.⁴ However, because of its design as an outpatient program, there can be issues with availability and therefore high rates of attrition are associated with this type of study, which could contribute to the variability in outcomes of outpatient studies.⁴

On the other hand, immersion therapies remove the overweight adolescents from their normal environment for a period of time in order to educate them and help them create better lifestyles.⁴ Also, immersion therapy does not appear to have issues with high attrition rates.⁴ Meanwhile, it is generally more expensive and thus less accessible for families with low socioeconomic status.⁴ One study found that immersion therapy was seemingly much more effective than outpatient CBT.⁸ After treatment, immersion therapy had 191% greater reduction in percent overweight compared to outpatient CBT.⁸ However, more focused randomized control trials need to be done to solidify these results.⁴

Summary and Discussion

Research on obesity treatment is ongoing in many different facets. Multifactorial causes of obesity make it challenging to find the most effective treatments. These complicated factors include the physiology of the body, the environment, psychological health, and genetics. In turn, there are numerous factors controlling the weight of the human body.

There are positive and negative attributes to both therapies. Behavioral therapy also has little to no discussion of side effects, while Orlistat has negative GI effects. These side effects have potential to cause patients to stop using the prescribed drug therapy. Orlistat also lacks long-term research, thus the long-term effects of Orlistat have not yet been determined. On the other hand, behavioral therapy has well-documented, beneficial long-term effects. It not only shows results in terms of weight loss but also in terms of mental health. CBT focuses on lifestyle changes that improve psychological factors that may be causing the obesity. In addition, it allows better choices and self-regulation, increasing likelihood of lifelong effects. Overall, CBT has been shown to create beneficial outcomes in different types of treatments. It improves lifestyles and psychological functioning. Additionally, immersion eliminates negative influences resulting from the culture and environment.⁴ However; Orlistat gives faster results, which could jump-start the weight loss process for a struggling adolescent. It would be particularly beneficial for those who seem to have lost hope. In conjunction, these treatments have the potential to be very effective. Using Orlistat to begin weight loss can increase an adolescent's incentive to stick to the program. Then, using CBT, their lifestyle choices and quality of life can be improved.

We believe that it is important to emphasize two aspects pertaining to these two therapy options. First, Orlistat is not a first option treatment for adolescents, and is rarely used alone. Usually it is used in addition to another type of treatment.

Second, CBT treatments were able to take a new perspective on the term "successful." That is, CBT could be used as a way to maintain weight while adolescents grow, because as they grow they become older, and taller at which point that same body weight will be within normal range. Thus, weight loss goals should be reassessed throughout the adolescent years to account for growth and body changes. Further studies are clearly needed in this area. One aspect to be investigated is the longitudinal effects of CBT and Orlistat on treating adolescent obesity. Future research should also focus on sustainability and side effects associated with a long-term use of CBT and Orlistat for adolescents.

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