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Obesity in Postmenopausal Rural Women: Clinical and Psychological Prevention and Treatment Techniques

Abstract

Obesity has become increasingly pervasive in rural areas of the United States as access to high calorie food increases, access to nutrient-dense food decreases, and lifestyles become more sedentary. Effective and accessible treatment and prevention techniques for obesity are critical public health concerns that will persist into the future. As the global population grows older and more obese, treatments tailored to older adults will only become more important. As postmenopausal women have differences in physiology from both younger women and older men, treatments will need to be tailored to fit their specific needs. Populations of older women in the United States also have some of the highest levels of poverty, which exacerbates obesity and related conditions.

Introduction

Obesity and excess weight affect 60% of American adults today, with 29% of women over 65 struggling with obesity (defined as a BMI of >30)¹. Obesity especially impacts rural women by exacerbating conditions of aging such as dementia, frailty, and sarcopenia (the age related loss of muscle strength, function, or mass)². Seven out of the ten leading causes of death are caused or exacerbated by obesity¹. It is therefore critical to examine evidence-based therapies in the context of older adult women who have differences in cardiovascular physiology, energy balance, and fat-deposition patterns in relation to younger adults and older men³. Deposition abdominally versus subcutaneously increases inflammatory macrophage activity and is linked to the low-grade chronic inflammation found in obesity³. Crucially, environmental and genetic factors determine 40-70% of cases of obesity nationwide⁴. Lack of motivation is not a factor leading to obesity². Older adults are commonly not expected to benefit from weight loss. In fact, 95% of adults over 65 could benefit from diet and lifestyle counseling from their PCP (primary care provider), but only 62% received it⁵. Healthcare professionals must address and work against these internal biases prompting them to focus efforts away from healthy lifestyle counseling in the elderly. Effects of treatment can be life-changing. It reduces the risk and/or impact of related conditions like hypercholesteremia, urinary stress incontinence, gastroesophageal reflux disease, osteoarthritic, hypertension, uterine and breast cancers, and type 2 diabetes^{3,4,6}. In addition, morbid obesity is linked to mood and other psychiatric disorders, although this could be a side effect of anti-psychotic medications⁷.

Biochemistry of Obesity

Once fats are digested, free fatty acids circulate in the bloodstream and enter cells lining blood vessels (endothelial cells)⁸. Once inside endothelial cells, they are bound by proteins which decide their fate, Many serve to activate genes specific to fat breakdown, or conversion of saturated fat to unsaturated fat⁸. When fat accumulates in body tissues, it begins releasing its own signals, which cause many of the problems

associated with obesity⁸. Signals are specific to the location of the fat, which is commonly deposited subcutaneously (below the skin), in the liver, or in the abdominal cavity⁸. These signals increase inflammation, cellular death, and induce insulin resistance⁸. Leptin is a hormone which signals fullness, but obese individuals become resistant to this signal over time^{4,8}.

Obesity Prevention – Exercise

Exercise is the only thoroughly studied obesity prevention measure for older adults: a systematic review found a 30-50% decrease in disability and functional limitation with deliberate, adequate exercise⁵. Adequate exercise is defined as at least 30 minutes of moderate exercise 5 days per week⁵. Deliberate exercise is defined as non-incident exercise like riding a bicycle, yoga, or a brisk walk⁵. Exercise may have the added benefit of preventing mild cognitive impairment, which is linked to dementia⁵.

Reducing poverty rates among older women would also reduce or entirely prevent obesity by promoting high quality food access as well as access to green spaces that promote healthy living⁹.

Tier 1 Treatments: Diet and Lifestyle Counseling

A systematic review found diet and lifestyle counselling to be equally effective, if not more effective in older adults than younger adults². Additionally, these treatments have low to no cost, no risk of polypharmacy, and no increase in mortality². Most diets that are safe and effective for younger adults are safe and effective for older adults, with the exception of very low-calorie diets which can lead to cold intolerance, dizziness, and constipation². Only regimens that combine diet, strength training, and aerobic exercise - together termed lifestyle change, are consistently effective in older adults^{2,6}. Psychological counselling is also recommended for best results, though there was no mention of approaches tailored to older adults⁴. Counseling may include recording food intake, mindfulness meditation, and psychotherapy⁴. Web-based interventions can be an option for those without access to in-person counselling, however, they are only 66% as effective as in-person counselling⁴. The only negative effect of tier 1 treatments was a slightly increased risk of osteoporosis in individuals 80 or older⁶. Lastly, even if patients did not lose weight during or after treatment, health did improve on a number of other metrics including: dose reduction of antihypertensives, improved insulin production and resistance, less pain, higher mobility, better sense of self-efficacy, water intake, improved muscle strength, and lowered inflammation^{2,4,6}. Only modest improvements were observed in psychiatric disorders and sleep apnea with obesity treatment¹⁰.

The transtheoretical model (TTM) is used to initiate behavior change and can be used with or without the help of a healthcare provider¹¹. It includes five stages of behavior change: Precontemplation, Contemplation, Preparation, Action, and Maintenance¹¹. Precontemplation is the period before an individual is considering a lifestyle change, they actively avoid confronting the topic¹¹. Providers help an individual at this stage by prompting them to make a pros and cons list and focus on reducing the cons¹¹. Contemplation includes actively addressing the cons and preparation involves

planning to make the change¹¹. Making specific goals using a schedule or calendar is more effective than making vague goals like: "I'm going to exercise more¹¹." During the action stage, the plan is implemented¹¹. Maintenance begins after six months of successful behavior change, and should comprise a plan for continuation¹¹. Crucially, failure is very common with use of the TTM model, however during each subsequent use, it becomes more successful and easier¹¹. It is critical for healthcare providers to prompt patients to continue working on their goals in a non-judgmental manner¹¹.

Tier 1 treatments could be altered for easy use by older, rural women if online counseling, over-the-phone support groups, and telemedicine could be utilized. For people who have a BMI >30 and qualify for Medicare, face-to-face visits are covered for 12 months provided 6.6 lbs are lost¹². Telemedicine appointments would be an effective way to proceed with appointments so that rural women would not need to travel. Telemedicine is covered by Medicare in Montana for providers willing to use it and adhere to certain guidelines¹³. Medicare does not cover Weight-Watchers or Jenny Craig, however the efficacy of these approaches is scientifically proven^{2,14}. Free online group services by Overeaters Anonymous could also aid in weight loss for many women, though these methods have not been tested scientifically¹⁵.

Tier 2 Treatments: Pharmacological Agents – Recommended in Conjunction with Tier 1

In older adults with normal kidney function, no dose adjustments were necessary, though studies of drug efficacy are less conclusive in this area because of a lack of randomized controlled trials¹. Weight-reduction medications produce modest results, which may or may not be significant enough to induce lifestyle change, and they may not be covered by insurance^{2,4}.

New targets for obesity include changing the gut microbiome, especially in terms of epigenetic changes associated with short chain fatty acids (SCFA) produced by gut bacteria¹⁶. There is promising research in mice indicating that high sugar, high fat diets limit SCFA production by gut microbiome, pointing to consumption of fermentable complex polysaccharides as part of a healthy diet¹⁷.

Tier 2 treatments could be enhanced for easier use by older rural women by providing options for distance care such as telemedicine which would facilitate prescription refill and monitoring. Medicare does not cover Lorcaserin (Belviq), which has an average out of pocket cost of \$345 for a 2 month supply¹⁸. Lorcaserin is the only weight-loss medication that has been thoroughly tested in older adults². Other weight loss drugs (Qysmia, Xenical, Contrave, and Saxenda) have not tested in older adults, but had an average two-month cost of \$703¹⁹. These drugs are not covered by most Medicare plans¹⁹. These medications also have extremely unsatisfactory side effects ranging from diarrhea to depression²⁰. Tier 2 treatments are ill-advised in older adults due to unfavorable side effects, high cost, and low efficacy.

Tier 3 Treatments: Bariatric surgery

Bariatric surgeries are designed to limit the size of the stomach or decrease fat absorption and are indicated in cases where Tier 1 (and sometimes Tier 2 treatments)

have failed². There are no randomized controlled trials examining the safety and efficacy of bariatric surgeries in older adults, however, it is logical to assume an increased risk of complications². These surgeries are highly effective at promoting weight loss, and patients (adults <60) lost 16-32% of their body weight with Roux-en-Y gastric bypass (RYGB) procedures⁴. They are highly effective in decreasing morbid obesity associated mortality; patients tend to regain 5-10% of their weight in 10 years with the RYGB and laparoscopic gastric sleeve procedures⁴. Patients who received gastric banding procedures regained a larger proportion of their weight overtime⁴. Vagal nerve blockade is sometimes indicated for cases of morbid obesity that have not responded to standard of care treatment²¹. This procedure can change satiety signaling so patients have a reduced urge to eat²¹. This method has not been studied in older adults, is not covered by any Medicare plan, and has an average cost of approximately \$19,500²¹. It would therefore be ill-advised for most patients.

RYGB and sleeve gastrectomy surgery are covered by Medicare provided a patient has attempted to lose weight for 5 years prior to the surgery and has one or more obesity-related conditions¹⁴. Outpatient care needs to be regularly administered for around 6 months following surgery, so a rural patient would need to remain close to a major surgical center during that time. For rural women suffering from morbid obesity, bariatric surgery is an effective treatment because it allows for rapid weight loss.

Conclusion

It is critical that evidence-based approaches are used to inform diet and lifestyle counseling as weight loss scams and panaceas abound. Psychological and physical changes that occur during weight gain make permanent weight loss extremely difficult⁴. Physicians alone cannot change the trajectory of the obesity epidemic. Targeting food availability and poverty in older, rural women are only two of many public health approaches that will need to be implemented to reduce the enormous burden on the American populace.

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