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Can Lifestyle Changes Improve Erectile Dysfunction?

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One in 10 men experiences erectile dysfunction, negatively affecting quality of life and potentially causing low self-esteem, stress, and anxiety.[1-3] The Cleveland Clinic defines erectile dysfunction as "the inability to achieve and sustain an erection suitable for sexual intercourse."[1] The International Index of Erectile Dysfunction Questionnaire, which deals with erectile function and sexual satisfaction, aids in classifying erectile dysfunction as mild, moderate, or severe.[3]

Treatments for erectile dysfunction currently include oral medications, mechanical devices, and psychological counseling (if stress is the sole cause of the condition). Medications such as tadalafil (Cialis) and sildenafil (Viagra) increase blood flow to the penis by enhancing the effect of nitric oxide, which leads to an erection. Mechanical devices include pumps or implants that physically pump blood into the penis, causing an erection.

Certain lifestyle factors put some men at a higher risk of developing erectile dysfunction. Diet and exercise play a role in decreasing those risk factors and therefore are recommended as supplements to current treatments.[2]

Lifestyle Factors

For a man to attain and maintain an erection, he needs strong blood flow into the penis and reduced blood flow from the penis. When the nerve endings to the penis are damaged, the brain can't signal to the penis to initiate blood flow and generate an erection.[1]

There are physical and psychological causes of erectile dysfunction. Psychological causes include anxiety, depression, and stress, while physical causes include neurological conditions (eg, Parkinson's disease, stroke, spinal cord injury, nerve damage resulting from certain prostate cancer treatments), and vascular conditions (eg, atherosclerosis, coronary artery disease, endothelial dysfunction).[1,3,4] Research suggests a close relationship between erectile dysfunction and cardiovascular disease (CVD), as erectile dysfunction is both a symptom and an indicator of CVD.[4]

Diabetes also can be a risk factor for erectile dysfunction. Uncontrolled diabetes leads to poor long-term blood sugar control, and when blood sugar remains uncontrolled, this can cause nerve and blood vessel damage, negatively affecting the blood supply to the penis.[5-7] In addition, certain medications, including corticosteroids, beta blockers, antihistamines, and diuretics, can cause erectile dysfunction.[1,2,4]

Specific lifestyle factors are associated with a variety of chronic diseases and also with erectile dysfunction, specifically a sedentary lifestyle and being overweight or obese.[3,8-11] Research suggests that obesity is associated with endothelial dysfunction and inflammation.[7,12,13] The consequence of chronic inflammation is a reduction in vasodilator production, which can decrease blood flow to the penis.[6] Studies indicate that weight loss, diet, and exercise can improve endothelial function and reduce inflammation to improve erectile dysfunction.[8,9]

Exercise

Exercise is recommended as part of a healthful lifestyle and to help manage chronic diseases, and it also may benefit patients with erectile dysfunction.[8,10-15] One study, aimed at examining lifestyle changes and their effect on erectile dysfunction, discovered that men who were given specific advice on ways to increase their level of physical activity (such as types and duration) saw greater improvements in erectile function than did men who were sedentary.[8] In another study examining potential risk factors for erectile dysfunction, nearly all men aged 75 and older reported having moderate or severe erectile dysfunction, but high physical activity levels were associated with lower odds of having the condition in this group.[10]

In another study, researchers placed older men with hypertension who also complained of erectile dysfunction on an exercise regimen for eight weeks. The regimen consisted of interval training for 45 to 60 minutes per day at 60% to 79% of their maximum heart rate. The results were significant with regard to the improvement of erectile dysfunction.[14] Researchers theorized that exercise produces nitric oxide, which can lead to smooth muscle relaxation and blood flow.[14]

A study using rats concluded that even when they consumed a diet high in fat and sugar, aerobic exercise performed five days per week helped reduce the incidence of erectile dysfunction and coronary artery dysfunction, while their sedentary counterparts were more likely to develop such problems.[15]

In a recent review of literature, the authors examined the current recommendations for lifestyle changes given to men with erectile dysfunction. Researchers concluded that the recommended amount of daily aerobic exercise should be at least 30 minutes, and that men should burn, on average, a minimum of 300 to 500 kcal to achieve the benefits of exercise for erectile dysfunction.[11]

Weight Loss

Being overweight or obese has been linked to myriad chronic diseases, and now evidence indicates it may contribute to erectile dysfunction because of the incidence of endothelial dysfunction and inflammation in obese men.[4,6,7,10,12,13] Multiple studies have examined certain dietary interventions focused specifically on weight loss and found that losing weight improved erectile function in obese men.[5-7]

One study looked at the effect of weight loss on erectile dysfunction, specifically in men with diabetes. The men were split into two groups: an intensive lifestyle intervention group and a control group. The intensive lifestyle intervention group received the following:

• education on calorie restriction to promote weight loss (goal of losing at least 7% of initial body weight in one year);

• encouragement to engage in moderate-intensity activity for 175 minutes per week;

• individual and group sessions, which involved discussions on specific calorie goals and meal plans to achieve those goals, increased intake of fruits and vegetables, and specific behavior modifications; and

• weekly meetings during the first six months and three meetings per month during the last six months.

The control group attended an initial meeting that provided basic education about diabetes. Participants had the option to attend three additional meetings about diet and physical activity during the year.[5]

Results from the intensive lifestyle intervention group showed a 10% reduction in body weight, but only 22% saw some improvement in their erectile function. The authors concluded that weight loss was mildly helpful in improving erectile dysfunction.[5]

This study was based on previous research that had reported weight loss as benefiting erectile dysfunction. The authors suggested that the difference in their results could be due to the neurogenic effects of erectile dysfunction, which may limit the ability to reverse this condition in men with diabetes. This study didn't have specific inclusion criteria regarding diabetes, while other studies did. Men were excluded only if their diabetes was poorly controlled, which was assessed by having a hemoglobin A1c level greater than 11%.[5]

At about the same time, however, a similar study was conducted in which obese men with and without diabetes were placed on a low-calorie diet (approximately 800 to 900 kcal/day), which involved consuming liquid meal replacement shakes and one small meal daily for eight weeks. For those with diabetes, the disease had to be controlled either by diet or medication, and A1c had to be lower than 7%. The participants experienced an average weight loss of 10% of their body weight, regardless of whether they had diabetes.[6]

The results also demonstrated significant improvements in sexual function, and the authors concluded that the diet significantly induced weight loss and rapidly improved sexual function in middle-aged obese men with or without diabetes.[6]

In a follow-up study, the same authors compared a low-calorie diet (approximately 900 kcal/day comprised of liquid meal replacement shakes and one small meal) with a high-protein, low-carbohydrate diet designed to reduce the participants' current caloric intake by about 600 kcal/day. This daily diet consisted of 10.5 oz (300 g) of lean meat, poultry, or fish; three servings of cereal, bread, or low-fat dairy; two fruit servings; five vegetable servings; and 2 L of fluid (water, tea, coffee, and diet soda allowed). Men in both groups kept food diaries that were reviewed every two to four weeks, and they were given detailed diet information with written meal plans, menus, recipes, and education on cooking in and eating out. Similar to the previous study, the participants' diabetes, when present, had to be controlled with the same inclusion criteria.[7]

The authors measured endothelial function, systemic inflammation, and erectile function. Both groups lost weight and saw similar improvements in their sexual desire and erectile function, although the high-protein, low-carbohydrate diet was thought to be more effective for

maintenance or further improvement of erectile function. The weight loss also resulted in improved endothelial function and reduced systemic inflammation.[7]

Specific weight-loss interventions appear to result in the greatest improvements in erectile function. Men given specific advice on how to lose weight saw more improvements in their erectile function than did men who simply were given general information about a healthful diet.[5,8] The goal of at least 10% weight loss appears to be effective in obese men with well-controlled or no diabetes.[5]

Still, it's unclear whether weight loss directly affects erectile dysfunction or whether improvements in erectile function are a secondary side effect. Some researchers hypothesize that this improvement could be due to the fact that weight loss can improve overall mood and self-esteem, which would address the psychological causes of erectile dysfunction. Another possibility is that improved function results from decreased inflammation or increased testosterone caused by weight loss.[11]

Mediterranean Diet

When examining specific dietary interventions in relation to erectile dysfunction, multiple studies have looked specifically at the Mediterranean diet, which involves eating a diet high in fruits and vegetables; limiting intake of refined sugars and processed foods; consuming more whole grains, legumes, nuts, and seeds; replacing butter with healthful fats such as olive oil; decreasing sodium intake by using more herbs and spices; limiting red meat consumption and increasing fish and poultry intake; and drinking red wine in moderation (optional).[12]

One study was conducted to determine whether the Mediterranean diet had any effects on erectile dysfunction in men with the metabolic syndrome.[13] This group has multiple risk factors for erectile dysfunction, usually including diabetes, heart disease, and obesity. One-half of the men participating in this study formed the control group, while the other half were placed on a two-year dietary intervention calling for participants to follow a Mediterranean diet. The intervention group received education on how to cut calories, set goals, and keep a food diary; participated in monthly small-group sessions; and received personalized diet advice based on three-day food records, which encouraged the consumption of fruits, vegetables, nuts, whole grains, and olive oil and discouraged the consumption of red or processed meat.[13]

The intervention group took part in monthly sessions with a nutritionist during the first year and then bimonthly sessions during the second year. The men in the control group were given general diet education without an individualized program or regular meetings with a nutritionist.[13]

At the end of two years, the men in the intervention group were eating more olive oil, nuts, whole grains, fruits, and vegetables. They saw improvements in erectile dysfunction scores, but only one-third regained normal sexual function. The authors concluded, based on the reduced levels of C-reactive protein, that the Mediterranean diet could be used to improve vascular function, which can include erectile function. C-reactive protein is a marker of inflammation, which can negatively affect erectile function.[13]

Since then, other studies have looked at the connection between the Mediterranean diet and the incidence of erectile dysfunction. One study assessed the diets of men with type 2 diabetes

and found that the greater their adherence to the Mediterranean diet, the lower the prevalence of erectile dysfunction. It's important to note, however, that the men who closely followed the Mediterranean diet also were more physically active and had lower BMIs, which could have affected the prevalence of erectile dysfunction.[16]

Esposito and colleagues reviewed similar studies and reached the same conclusion. They determined that men who followed a dietary pattern high in fruits, vegetables, nuts, whole grains, and fish, and low in red and processed meat, and refined grains were less likely to experience erectile dysfunction.[17]

What aspect of the Mediterranean diet appears to positively affect erectile dysfunction? The diet has been touted for its ability to reduce CVD, and improved vascular function leads to an improvement in blood flow to the penis.

Another study concluded that patients with erectile dysfunction have high markers of oxidative stress compared with those without dysfunction.[18] Oxidative stress causes inflammation, which can lead to endothelial dysfunction. The Mediterranean diet naturally is high in antioxidants, which can reduce inflammation. Research indicates that men consuming the Mediterranean diet showed improvements in inflammatory markers and endothelial function.[13]

Supplements

Supplements are marketed to address everything from heart disease to sleep deprivation. The FDA has limited rules and regulations regarding supplements and the claims that companies can make regarding their effectiveness. There are numerous dietary supplements on the market claiming to cure erectile dysfunction, and many of them have been put on the FDA's Online Supplements to Avoid list.[19] Some, for example, are considered hazardous because they may contain undeclared ingredients or unapproved substances with similar chemical structures to the active ingredients in sildenafil.[20] Additional supplements are discussed below.

Korean Red Ginseng

One supplement popular among individuals with erectile dysfunction is Korean red ginseng, also called Panax. It's thought that the ginsenoids found in ginseng are the active ingredient that improves sexual function.[21] They're believed to have multiple potential health benefits, such as being antihypertensive, antidiabetic, antiatherosclerotic, and anti-inflammatory, as well as having positive effects on the central nervous system.[22]

Multiple studies have concluded that Korean red ginseng may be a useful, natural alternative for men suffering from erectile dysfunction.[21,23] In his paper on the management of erectile dysfunction, Heidelbaugh stated that supplementation with about 900 mg of Korean red ginseng three times daily has been reported to show some improvement in symptoms of erectile dysfunction.[4] However, he went on to say that it wasn't recommended by the American Urological Association because of concerns regarding safety and effectiveness; he didn't elaborate on the reasons.[4]

One study specifically looked at the safety and efficacy of Korean red ginseng using physical exams, self-reporting, and clinical lab tests. After eight weeks, lab work didn't show any differences in erectile function, and no adverse reactions were reported. The results did show some improvement in erectile dysfunction.[23]

At this time, there's insufficient evidence to recommend Korean red ginseng to men with erectile dysfunction. According to the American Urological Association, while studies have shown some results regarding Korean red ginseng, based on insufficient data, [the association] can't make recommendations for use of herbal therapies.[3]

L-Citrulline/L-Arginine

In the past, researchers discovered that L-arginine improved endothelial function and increased nitric oxide production.[24,25] L-arginine is an amino acid, mainly obtained from food sources such as animal protein or in supplement form. The body uses L-arginine to make nitric oxide, a gas that increases blood flow. Nitric oxide triggers the smooth muscle of the penis to relax, which then allows blood to flow into the penis, causing an erection.[4]

However, L-arginine supplements have limited bioavailability because of how they're metabolized. When ingested, the supplement's L-arginine concentration is greatly reduced during the absorption process, so only a fraction of L-arginine enters the circulatory system.[24]

Newer research has looked at L-citrulline supplementation as potentially benefiting men with erectile dysfunction. L-citrulline also is an amino acid, but it's naturally produced in the body and is converted to both L-arginine and nitric oxide. Therefore, it produces L-arginine in the body more efficiently, subsequently increasing nitric oxide production. Although data are limited, L-citrulline could be considered as a potential alternative therapy to medications for erectile dysfunction.[24,25]

While dietitians may not recommend specific supplements for erectile dysfunction, they should be aware of the latest research and supplements available to clients and patients. When discussing supplements, dietitians always should encourage clients and patients to talk with their physicians before starting any kind of supplement program. Dietitians also should be aware of potentially harmful supplements on the market. More information both for dietitians and consumers is available at www.fda.gov/forconsumers/consumerupdates/ucm048386.htm, including an extensive list of supplements that should be avoided.

Putting It Into Practice

Erectile dysfunction negatively affects men's quality of life. When working with men who have diabetes, obesity, and/or CVD, it's important for dietitians to address whether they're also experiencing erectile dysfunction. Dietitians should talk to these clients and patients about the relationship between these diseases and the symptoms they may be experiencing, as this may motivate them to make specific lifestyle changes.

While there's limited research and results seem to vary, certain positive lifestyle changes may be associated with improvement in erectile dysfunction. Dietitians can be most effective in helping their clients with erectile dysfunction by providing an intensive lifestyle intervention. This includes diet education, exercise recommendations, specific meal plans, and ongoing sessions to provide accountability and support. Specific interventions can include recommending a 10% loss of initial body weight as well as encouraging clients to reduce red meat intake, and increase their consumption of fruits, vegetables, whole grains, and healthful fats, such as nuts and olive oil. What appears to be most effective is a more personalized approach, with regular sessions to review food diaries and monitor clients' adherence to the

Mediterranean diet. Also, it's important to make ongoing specific recommendations as to how they can improve their diet and exercise routine.

Even though there isn't enough evidence to support a specific erectile dysfunction diet, dietitians can encourage their male clients and patients to increase physical activity, maintain a healthy body weight, adopt a heart-healthy diet and, if they have diabetes, maintain proper blood sugar control.

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Click here for tip sheet "Lifestyle Changes to Improve Erectile Dysfunction."

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Examination

1. Which of the following is considered a risk factor for erectile dysfunction that can be improved with lifestyle changes?
A. Obesity
B. Underweight
C. Lack of sleep
D. Food allergies

2. Which chronic disease is considered to have the closest relationship to erectile dysfunction and for which erectile dysfunction could be an indicator?
A. Diabetes
B. Hypothyroidism
C. Cancer
D. Cardiovascular disease

3. Through which of the following ways is exercise believed to improve erectile dysfunction?
A. Increased endorphin production
B. Increased nitric oxide production
C. Increase in muscle mass
D. Increase in VO2 max

4. Which diet has been researched as a possible recommendation for patients dealing with erectile dysfunction?
A. Mediterranean
B. Vegan
C. Atkins
D. Paleo

5. What is thought to be the active ingredient in Korean red ginseng to improve erectile dysfunction?
A. Omega 3 Fatty Acids
B. Nitric Oxide
C. Ginsenoids
D. Glucosamine

6. L-citrulline is more efficient at producing nitric oxide because it's converted to which amino acid?
A. L-alanine
B. L-tyrosine
C. L-tryptophan
D. L-arginine

7. Why is obesity considered a risk factor for erectile dysfunction?
A. Obese men generally don't exercise.
B. Obese men eat high-fat diets.
C. Obese men are more likely to be depressed.
D. Obese men have higher levels of inflammation.

8. What is one lifestyle recommendation an RD can make to a patient who's suffering from erectile dysfunction?
A. Lose weight.
B. Meditate.
C. Take a multivitamin.
D. Get more sleep.

9. What is one dietary recommendation an RD can give a patient who's suffering from erectile dysfunction?
A. Drink white wine.
B. Increase fruit and vegetable intake.
C. Boost red meat intake.
D. Eliminate all dairy products.

10. What is the dietitian's primary role in counseling patients with erectile dysfunction?
A. Recommending supplements
B. Counseling the patient on diet improvement and weight loss
C. Counseling the patient on how to manage stress
D. Recommending treatment options for erectile dysfunction