Cochrane for Clinicians

Putting Evidence Into Practice

Reduced Dietary Salt for Patients With Chronic Kidney Disease

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Clinical Question

Does reducing dietary salt intake lower blood pressure or albuminuria in patients with chronic kidney disease (CKD)?

Evidence-Based Answer

In patients with CKD, reducing dietary salt intake by approximately 4.2 g per day (73.5 mmol or 1,690 mg of sodium) lowers mean systolic blood pressure by 6.9 mm Hg (95% CI, 5.0 to 8.8 mm Hg) and diastolic blood pressure by 3.9 mm Hg (95% CI, 3.0 to 4.8 mm Hg) compared with patients on a higher salt diet. In patients with CKD who do not have end-stage renal disease, a low-salt diet also decreases mean albuminuria by 36% (95% CI, 26% to 44%) compared with a higher salt diet.[1] (Strength of Recommendation: C, disease-oriented evidence.)

Practice Pointers

CKD is a major global health concern affecting an estimated 9.37% of the world's population, and was the 6th most common cause of non–injury-related death in 2019 in the adult population, accounting for 1.42 million deaths worldwide.[2] There has been a 42% increase in deaths among patients with CKD from 2009 to 2019, making it one of the fastest rising major causes of death. The risk of cardiovascular disease and death increases with worsening glomerular filtration rate, which is a measurement used to determine the severity of CKD. Effective strategies for prevention of these negative outcomes might improve patient prognosis and reduce health care costs. Dietary salt intake is a modifiable risk factor thought to reduce progression of CKD, so the authors of this review sought to discern the benefits and harms of reducing dietary salt intake in adults with CKD.

This Cochrane review involved 21 studies with a total of 1,197 randomized participants recruited in the United States, Europe, Asia, and Australia.[1] The 2021 update included randomized controlled trials (RCTs) and quasi-RCTs of patients 18 years and older who had CKD and a glomerular filtration rate of less than 60 mL per minute per 1.73 m^2, were receiving kidney replacement therapy, had a functioning kidney transplant, or had proteinuria (National Kidney Foundation Kidney Disease Outcomes Quality Initiative stage 1 to 5) or elevated serum creatinine (greater than 1.36 mg per dL [120 μmol per L]). Study duration ranged from one to 36 weeks, with a median of seven weeks. The four-week mark was used as the cut-off to classify short-term vs. long-term intervention. Methods used to determine sodium intake were heterogeneous and included either 24-hour urine sodium excretion (15 studies) or the use of food records or 24-hour patient recall.

Reducing salt intake by 4.2 g per day (73.5 mmol or 1,690 mg of sodium) reduced systolic blood pressure (mean difference [MD] = 6.9 mm Hg; 95% CI, 5.0 to 8.8 mm Hg; high-certainty evidence) as well as diastolic blood pressure (MD = 3.9 mm Hg; 95% CI, 3.0 to 4.8 mm Hg; high-certainty evidence) in short-term (less than four weeks) and long-term (four weeks or more) studies. Ambulatory blood pressure monitoring over the course of 24 hours was used preferentially when more than one blood pressure measurement was reported, and clinic-assessed blood pressures were used preferentially instead of self-assessed measurements. Standing blood pressure was preferred when measurements from more than one position were reported.

In six studies of 436 participants, reducing dietary salt intake decreased the 24-hour urinary protein excretion in patients with CKD stages 1 to 4 (MD = 0.41 mg per day; 95% CI, 0.25 to 0.58 mg per day). Symptomatic hypotension occurred

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more often with reduced salt intake (number needed to harm = 21; 95% CI, 7 to 83; moderate-certainty evidence) based on data from six studies of 478 participants with CKD stages 1 to 4 in short-term (less than four weeks) and long-term (four weeks or more) interventions. The recorded symptomatic hypotension episodes were mild.

Another meta-analysis of 11 RCTs of 738 patients with CKD stages 1 to 4 showed improvements in blood pressure and proteinuria with moderate dietary salt reduction.[3] Considering these data, there is strong evidence that lower dietary salt intake decreases blood pressure, and moderate evidence that it lowers proteinuria in patients with CKD. The National Institute of Diabetes and Digestive and Kidney Diseases recommends total dietary salt intake of less than 2,300 mg per day for patients with CKD.[4]

The practice recommendations in this activity are available at https://www.cochrane.org/CD010070.

Editor's Note: The number needed to harm and its corresponding CI reported in this Cochrane for Clinicians was calculated by the authors based on raw data provided in the original Cochrane review.

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Kinesiology Taping for Rotator Cuff Disease

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Clinical Question

Is kinesiology taping safe and effective for the treatment of rotator cuff disease in adults?

Evidence-Based Answer

Kinesiology taping for adults with rotator cuff disease has little to no benefit compared with sham taping or conservative (i.e., nonsurgical) therapy.[1] (Strength of Recommendation: B, inconsistent or limited-quality patient-oriented evidence.)

Practice Pointers

Rotator cuff disease is an umbrella term encompassing disorders such as rotator cuff tendinopathy, impingement syndrome, subacromial bursitis, and others. This group of conditions is likely the most common cause of shoulder pain.[2]

Kinesiology taping is the use of an adhesive cotton elastic tape on the skin, theoretically to affect the function of the joint closest to where the tape is placed. It was developed in the 1970s in Japan, where it was theorized to reduce localized pain and allow healing by lifting the skin to increase interstitial space. It also reportedly improves proprioception. The tape is latex-free and contains no active pharmacologic agents. Products are available in a variety of elastic strength, size, and shape. In addition, there are numerous taping regimens. Kinesiology taping is widely used by rehabilitation specialists and is also available for self-application. The authors sought to determine the benefits of kinesiology taping as a sole treatment or as a co-intervention with commonly used conservative (i.e., nonsurgical) therapies for rotator cuff disease. Conservative therapies included pain management with medications (oral or injectable therapies), physical modalities (e.g., therapeutic ultrasonography, transcutaneous electrical nerve stimulation), and physical therapy, both supervised and home-based.

This Cochrane review included 23 controlled trials with 1,054 participants.[1] Nine trials (312 participants) assessed the effectiveness of kinesiology taping vs. sham taping. Fourteen studies (742 participants) assessed the effectiveness of kinesiology taping vs. conservative treatments. Most of the participants were between 18 and 50 years of age, and about 52% were women. Blinding was possible only when kinesiology taping was compared with sham taping. The certainty of evidence for all outcomes presented was rated as low to very low.

Mean overall pain (measured on a scale from 0 to 10, where 0 was absence of pain) was 2.96 points with sham taping and 3.03 points with kinesiology taping at four weeks; thus, there was no statistically significant difference. Compared with conservative treatment (mean overall pain score at rest = 0.9 points), kinesiology taping was not significantly different (mean overall pain score at rest = 0.46 points) at six weeks. During motion, participants who received sham taping had a mean pain score of 4.39 points, whereas participants who received kinesiology taping had a mean score of 2.91 points (absolute improvement = 14.8%; 95% CI, 7.1% to 22.5%) at four weeks. However, there was no significant difference in pain scores at four weeks between patients treated with kinesiology tape and those treated with conservative measures. It is notable that the studies did not supply information regarding baseline levels of pain in these studies.

Mean function (measured on a scale from 0 to 100, where 0 was better function) was 47.1 points with sham taping and 39.05 points with kinesiology taping at four weeks, which was not statistically significant. Mean function with conservative treatment was 46.6 points and 33.47 points with kinesiology taping (absolute improvement = 13%; 95% CI, 2% to 24%) at four weeks. The studies did not supply information on baseline function scores.

Mean active range of motion (shoulder abduction) without pain was 174.2 degrees with sham taping and 184.43 degrees with kinesiology taping at two weeks, which was not statistically significant. Mean active range of motion with conservative treatment was 156.6 degrees; with kinesiology taping it was 159.64 degrees at six weeks, which was also not statistically significant. No studies reported global assessment of treatment success. The studies did not supply information regarding baseline range of motion scores.

Mean quality of life was reported using a scale of 0 to 100, with a higher score indicating better quality of life. Participants who received conservative therapy had an average score of 37.94 points, whereas those who used kinesiology tape had an average score of 56.64 points at four weeks (absolute improvement = 18.7%; 95% CI, 14.5% to 22.9%). The studies did not supply information regarding baseline quality of life scores.

A separate systematic review and meta-analysis concluded that kinesiology taping improves pain compared with no intervention but is no better than other treatment approaches.[3] One roll of generic kinesiology tape costs approximately $30 and contains about 20 strips in each roll. A six-week treatment, during which three strips are replaced every three days, would cost approximately $60. Family physicians may educate their patients that although kinesiology taping appears to offer little benefit compared with conservative therapies, there does not seem to be a risk of significant harm if a patient or physical therapist wishes to use it.

The practice recommendations in this activity are available at https://www.cochrane.org/CD012720.

The opinions or assertions contained herein are those of the authors and are not to be construed as official or reflecting the views of the Department of Defense or the Uniformed Services University of the Health Sciences.

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