**Short- and long-term effects of alkali therapy in chronic kidney disease: a systematic review.**

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**BACKGROUND:**

Clinical practice guidelines recommend alkali therapy in patients with non-dialysis-dependent chronic kidney disease (CKD) and metabolic acidosis to prevent complications from metabolic acidosis. We systematically reviewed the effect of sodium bicarbonate on benefits and harms in patients with CKD.

**METHODS:**

We searched for randomized controlled trials in MEDLINE (through July 2011), Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and scientific abstracts. We included trials that compared sodium bicarbonate to standard-of-care therapy or placebo that reported on kidney-related outcomes. We performed random-effects model meta-analyses to compute net changes (for continuous variables) and risk ratios (for binary variables).

**RESULTS:**

Two short-term (≤ 7 days) crossover trials and 4 long-term (≥ 2 months) parallel-design randomized controlled trials met eligibility (312 patients). All 6 trials prescribed sodium bicarbonate in the alkali-treated group. In the long-term studies, alkali therapy was associated with a net decrease in serum creatinine (-0.07 mg/dl, 95% CI -0.09, -0.05; p < 0.001; I(2) = 0), a net improvement in GFR (3.2 ml/min/1.73 m(2), 95% CI 1.6, 4.7; p < 0.001; I(2) = 0), and a lower incidence of dialysis initiation (risk ratio 0.21, 95% CI 0.08, 0.54; p = 0.001; I(2) = 0). No benefit was observed on the serum creatinine or GFR in short-term studies. Alkali therapy was not associated with a higher likelihood of initiating or escalating anti-hypertensive medications.

**CONCLUSIONS:**

Alkali therapy is associated with an improvement in kidney function, which may afford a long-term benefit in slowing the progression of CKD. However, differences in study protocols and small sample sizes preclude definitive conclusions.