

Citrate has theoretical advantages over heparin for locking hemodialysis central venous catheters (CVCs), but the comparative effectiveness of these agents is not clear” Grudzinski et al (2015).

Reference:

Grudzinski, A., Agarwal, A., Bhatnagar, N. and Nesrallah, G. (2015) Benefits and harms of citrate locking solutions for hemodialysis catheters: a systematic review and meta-analysis. Canadian Journal of Kidney Health and Disease. April 2nd. eCollection 2015.

Systematic review and meta-analysis of citrate locking solutions [@ivteam #ivteam](http://ctt.ec/wFQs5+)

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Abstract:

BACKGROUND: Citrate has theoretical advantages over heparin for locking hemodialysis central venous catheters (CVCs), but the comparative effectiveness of these agents is not clear.

OBJECTIVES: 1) To compare the benefits and harms of citrate versus heparin locking solutions among patients undergoing hemodialysis through CVCs; 2) to appraise methodological quality of the supporting evidence.

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ATA SOURCES:** CENTRAL, MEDLINE, EMBASE, CINAHL, ISI Web of Science, and nephrology conference abstracts.

STUDY ELIGIBILITY PARTICIPANTS AND INTERVENTIONS: We included randomized, parallel arm clinical trials that enrolled adult patients (>18 years) receiving chronic hemodialysis through CVCs using a citrate locking solution. We excluded studies in which citrate was combined with other agents, such as antibiotics.

APPRAISAL AND SYNTHESIS METHODS: We used the GRADE approach to systematic reviews and quality appraisal. Two reviewers performed data extraction independently and in duplicate. We pooled count data using generic inverse variance with random-effects models, and used fixed-effect models when only two studies were available for pooling. Subgroups

included low ($\leq 5\%$) vs. higher ($\geq 30\%$) citrate.

RESULTS: We screened 600 citations. Forty-one proceeded to full-text screen; 5 met inclusion criteria. Studies included between 19 and 291 participants (Median N = 61) followed for a total of 174.6 catheter-years; 2 were multi-centred trials. Three studies assessed all-cause mortality; the pooled relative risk for death was 0.71 (95% CI = 0.42-1.24; $p = 0.21$; $I^2 = 0\%$). The rate ratio for bacteremic episodes was 0.54 (95% CI = 0.23-1.29; $p = 0.16$; $I^2 = 65\%$) while the rate ratio for bleeding was 0.48 (95% CI = 0.3-0.75; $p = 0.001$; $I^2 = 5\%$). Rates of catheter exchange/replacement, all-cause hospitalization and in-situ thrombolysis were not significantly different between groups in any of the pooled analyses. Risk of bias within pooled studies was low.

LIMITATIONS: Outcome definitions varied across studies. Imprecision due to small sample sizes and low event rates reduce our overall confidence in the pooled effect estimates.

IMPLICATIONS: Benefits and harms of citrate vs. heparin locking solutions remain unclear; larger studies and standardization of outcome measurement and reporting are warranted.

TRIAL REGISTRATION: Protocol Registration Number: CRD42013004781.

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