This review looks at the effectiveness and safety of intermittent locking with heparin compared to 0.9% NaCl to see if the evidence establishes whether one is better than the other. This work is an update of a review first published in 2014″ López-Briz et al (2018).

Abstract:

BACKGROUND: Intermittent locking of central venous catheters (CVCs) is undertaken to help maintain their patency. There are systematic variations in care: some practitioners use heparin (at different concentrations), whilst others use 0.9% NaCl (normal saline). This review looks at the effectiveness and safety of intermittent locking with heparin compared to 0.9% NaCl to see if the evidence establishes whether one is better than the other. This work is an update of a review first published in 2014.

OBJECTIVES: To assess the effectiveness and safety of intermittent locking of CVCs with heparin versus normal saline (NS) in adults to prevent occlusion.

SEARCH METHODS: The Cochrane Vascular Information Specialist (CIS) searched the Specialised Register (last searched 11 June 2018) and the Cochrane Central Register of Controlled Trials (CENTRAL; 2018, Issue 5). Searches were also carried out in MEDLINE, Embase, CINAHL, and clinical trials databases (11 June 2018).

SELECTION CRITERIA: We included randomised controlled trials in adults ≥ 18 years of age with a CVC that compared intermittent locking with heparin at any concentration versus NS. We applied no restriction on language.

DATA COLLECTION AND ANALYSIS: Two review authors independently selected trials, assessed quality, and extracted data. We contacted trial authors to retrieve additional information, when necessary. We carried out statistical analysis using Review Manager 5 and assessed the overall quality of the evidence supporting assessed outcomes using GRADE. We carried out prespecified subgroup analysis.

MAIN RESULTS: We identified five new studies for this update (six prior studies were included in the original review), bringing the number of eligible studies to 11, with a total of 2392 participants. We noted differences in methods used by the included studies and variation in heparin concentrations (10 to 5000 IU/mL), time to follow-up (1 to 251.8 days),

and the unit of analysis used (participant, catheter, line access).Combined results from these studies showed fewer occlusions with heparin than with NS (risk ratio (RR) 0.70, 95% confidence interval (CI) 0.51 to 0.95; P = 0.02; 1672 participants; 1025 catheters from 10 studies; I^2 = 14%) and provided very low-quality evidence.We carried out subgroup analysis by unit of analysis (testing for subgroup differences (P = 0.23; I^2 = 30.3%). When the unit of analysis was the participant, results show no clear differences in all occlusions between heparin and NS (RR 0.79, 95% CI 0.58 to 1.08; P = 0.15; 1672 participants; seven studies). Subgroup analysis using the catheter as the unit of analysis shows fewer occlusions with heparin use (RR 0.53, 95% CI 0.29 to 0.95; P = 0.03; 1025 catheters; three studies). When the unit of analysis was line access, results show no clear differences in occlusions between heparin and NS (RR 1.08, 95% CI 0.84 to 1.40; 770 line accesses; one study).We found no clear differences in the duration of catheter patency (mean difference (MD) 0.44 days, 95% CI -0.10 to 0.99; P = 0.11; 1036 participants; 752 catheters; six studies; low-quality evidence).We found no clear evidence of a difference in the following: CVC-related sepsis (RR 0.74, 95% CI 0.03 to 19.54; P = 0.86; 1097 participants; two studies; low-quality evidence); mortality (RR 0.76, 95% CI 0.44 to 1.31; P = 0.33; 1100 participants; three studies; low-quality evidence); haemorrhage at any site (RR 1.32, 95% CI 0.57 to 3.07; P = 0.52; 1245 participants; four studies; moderate-quality evidence); or heparin-induced thrombocytopaenia (RR 0.21, 95% CI 0.01 to 4.27; P = 0.31; 443 participants; three studies; low-quality evidence).The main reasons for downgrading the quality of evidence were unclear allocation concealment, imprecision, and suspicion of publication bias.

AUTHORS' CONCLUSIONS: Given the very low quality of the evidence, we are uncertain whether intermittent locking with heparin results in fewer occlusions than intermittent locking with NS. Low-quality evidence suggests that heparin may have little or no effect on catheter patency. Although we found no evidence of differences in safety (sepsis, mortality, or haemorrhage), the combined trials are not powered to detect rare adverse events such as heparin-induced thrombocytopaenia.

Full Text

Reference:

López-Briz, E., Ruiz Garcia, V., Cabello, J.B., Bort-Martí, S., Carbonell Sanchis, R. and Burls, A. (2018) Heparin versus 0.9% sodium chloride locking for prevention of occlusion in central venous catheters in adults. The Cochrane Database of Systematic Reviews. July 30th. .

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