The review found that there was not enough evidence to determine the effects of intermittent flushing of heparin versus normal saline to prevent occlusion in long term central venous catheters in infants and children" Bradford et al (2015).

Abstract:

BACKGROUND: Guidelines and clinical practice for the prevention of complications associated with central venous catheters (CVC) around the world vary greatly. Most institutions recommend the use of heparin to prevent occlusion, however there is debate regarding the need for heparin and evidence to suggest 0.9% sodium chloride (normal saline) may be as effective. The use of heparin is not without risk, may be unnecessary and is also associated with increased cost.

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OBJECTIVES: To assess the clinical effects (benefits and harms) of intermittent flushing of heparin versus normal saline to prevent occlusion in long term central venous catheters in infants and children.

SEARCH METHODS: The Cochrane Vascular Trials Search Co-ordinator searched the Specialised Register (last searched April 2015) and the Cochrane Register of Studies (Issue 3, 2015). We also searched the reference lists of retrieved trials.

SELECTION CRITERIA: Randomised controlled trials that compared the efficacy of normal saline with heparin to prevent occlusion of long term CVCs in infants and children aged up to 18 years of age were included. We excluded temporary CVCs and peripherally inserted central catheters (PICC).

DATA COLLECTION AND ANALYSIS: Two review authors independently assessed trial inclusion criteria, trial quality and extracted data. Rate ratios were calculated for two outcome measures – occlusion of the CVC and central line-associated blood stream infection. Other outcome measures included duration of catheter placement, inability to withdraw blood from the catheter, use of urokinase or recombinant tissue plasminogen, incidence of removal or re-insertion of the catheter, or both, and other CVC-related complications such as dislocation of CVCs, other CVC site infections and thrombosis.

MAIN RESULTS: Three trials with a total of 245 participants were included in this review. The three trials directly compared the use of normal saline and heparin, however, between studies, all used different protocols for the standard and experimental arms with different concentrations of heparin and different frequency of flushes reported. In addition, not all studies reported on all outcomes. The quality of the evidence ranged from low to very low because there was no blinding, heterogeneity and inconsistency between studies was high and the confidence intervals were wide. CVC occlusion was assessed in all three trials (243 participants). We were able to pool the results of two trials for the outcomes of CVC occlusion and CVC-associated blood stream infection. The estimated rate ratio for CVC occlusion per 1000 catheter days between the normal saline and heparin group was 0.75 (95% CI 0.10 to 5.51, two studies, 229 participants, very low quality evidence). The estimated rate ratio for CVC-associated blood stream infection was 1.48 (95% CI 0.24 to 9.37, two studies, 231 participants; low quality evidence). The duration of catheter placement was reported to be similar between the two study arms, in one study (203 participants).

AUTHORS' CONCLUSIONS: The review found that there was not enough evidence to determine the effects of intermittent flushing of heparin versus normal saline to prevent occlusion in long term central venous catheters in infants and children. Ultimately, if this evidence were available, the development of evidenced-based clinical practice guidelines and consistency of practice would be facilitated.

Reference:

Bradford, N.K., Edwards, R.M. and Chan, R.J. (2015) Heparin versus 0.9% sodium chloride intermittent flushing for the prevention of occlusion in long term central venous catheters in infants and children. The Cochrane Database of Systematic Reviews. November 23rd. 11:CD010996. .

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