Abstract:

Background: Three meta-analyses conducted in the 1990s concluded that the effect of intermittent flushing with heparin at low concentration (10 U/mL) was equivalent to that of 0.9% sodium chloride flushes in preventing occlusion or superficial phlebitis. No firm conclusion was reached on the safety and efficacy of heparin concentrations of 100 U/mL used as an intermittent flush.

Purpose: To determine whether flushing peripheral intravenous catheters with 3 mL of a 100 U heparin/mL solution instead of saline improves the outcome of infusion devices.

Methods: Cluster-randomized, controlled, two-arm, open trial, conducted in a research and teaching hospital in Northern Italy, involving 214 medical patients without contraindications to heparin: 107 randomly allocated to heparin and 107 to saline flushes (control group). Main outcome measure was catheter occlusion and catheter-related phlebitis.

Results: Patients with either phlebitis or occlusion were 45 (42.1%) in the heparin group and 68 (63.6%) in the saline group (OR 0.41; 95% CI 0.24-0.72; p= 0.002); patients with occlusion
alone were 23 (21.5%) and 47 (43.9%), respectively (p= 0.03); patients with phlebitis alone were 28 (26.2%) and 56 (52.6%) respectively (p=<0.001). Similar results were obtained when the analysis was based on catheters. No heparin severe side effects were identified.


Conclusions: Heparin 100 U/mL in the maintenance of peripheral venous catheters was more effective than saline solution, in that it reduced the number of catheter-related phlebitis/occlusions and the number of catheters per patient, with potential advantages to both patients and the health system. It also appeared safe. However, subjects with platelet or coagulation defects were excluded, and, therefore, caution should be used when prescribing this type of catheter maintenance to patients at risk of bleeding.