VESSEL CLOSURE DEVICES: ARE THEIR USE JUSTIFIED? EVIDENCE FROM A META-ANALYSIS OF RANDOMIZED TRIALS

Poster Contributions
Poster Sessions, Expo North
Saturday, March 09, 2013, 10:00 a.m.-10:45 a.m.

Session Title: Radial Access
Abstract Category: 53. TCT@ACC-i2: Vascular Access and Closure Devices and Complications
Presentation Number: 2102-261

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Background: Vascular closure devices (VCDs) were developed as an alternative to manual compression at the puncture site and to hasten recovery and reduce hospital stay following percutaneous interventions.

Methods: A systematic literature search of MEDLINE (1966-March 2012), EMBASE (1989-March 2012), BIOSIS (1990-March 2012), CINHAL (1982-March 2012) databases and the Cochrane Central Register of Controlled Trials for relevant articles in any language. Included were randomized controlled trials reporting vascular complications at the puncture site (hematoma, bleeding, arteriovenous fistula, pseudoaneurysm, leg ischemia and need for surgical by intervention) and efficacy (time to hemostasis, time to ambulation, length of hospitalization and device success rates). Two reviewers abstracted the data independently and in duplicate. Random-effects models were used to pool the data.

Results: Forty trials met the selection criteria and included 9301 patients. When comparing any VCD with comparator, the relative risk(s) (RR) and 95% confidence interval(s) of groin hematoma was 0.97 [0.78, 1.21]; bleeding, 1.58 [0.96, 2.59]; developing an arteriovenous fistula, 0.15 [0.02, 1.22]; developing a pseudoaneurysm at the puncture site, 0.81 [0.47, 1.38]; significant leg ischemia 1.44 [0.23, 9.06]; need for surgical interventions 1.45 [0.60, 3.49]; and risk of blood transfusion 0.83 [0.32, 2.14]. Time to hemostasis was shorter in the group with VCD compared with standard compression (mean difference, 11 minutes; range, 10-13 minutes), as was time to ambulation (mean difference, 6 hours; range, 5-8 hours), length of hospital stay (mean difference, 7.3 hours; range, 1-12 hours) and a high rate of successful device deployment (98% overall), but there was a high degree of heterogeneity among studies. Network meta-analysis revealed comparable efficacy of collagen based VCDs and suture based ones.

Conclusions: Based on this meta-analysis of forty randomized trials, there is evidence that VCDs are effective in reducing time to hemostasis, ambulation and hospital discharge, while no contemporary evidence indicates superiority of one type of VCDs over others.