Abstract:

Aims: The aim of this systematic review and meta-analysis was to summarize and quantify peripheral intravenous catheter-related complications.

Design: This systematic review is reported by means of the Cochrane process for randomized controlled trials and the Meta-analysis of Observation Studies in Epidemiology for cohort studies.

Data sources: The Cochrane Central Register of Controlled Trials, PubMed, CINAHL and EMBASE databases, clinical trial registries such as ClinicalTrials.gov and the reference list of included studies were searched from 2000 -April 2019.

Review methods: Using a purpose designed data extraction tool, two authors independently identified studies for full review, data extraction and quality assessment. Dichotomous outcomes were pooled after Freeman-Tukey double arcsine transformation using random-effects meta-analysis; estimates of heterogeneity were taken from inverse-variance fixed-effect models.

Results: Seventy observational studies and 33 randomized controlled trials were included (76,977 catheters). Peripheral intravenous catheter-related complications were as follows: phlebitis (with definition) 19.3%, phlebitis (without definition) 4.5%, infiltration/extravasation 13.7%, occlusion 8%, leakage 7.3%, pain 6.4% and dislodgement 6.0%. Subgroup analysis found infiltration/extravasation for emergency department-inserted catheters was significantly higher (25.2%; p = .022) than for those inserted in other departments and pain was significantly higher (p < .001) in countries with developing economies compared with developed economies.

Conclusion: Peripheral intravenous catheter complications are unacceptably common worldwide. This review suggests substantial and multi-specialty efforts are needed to address the sequelae associated with complications. The potential benefits for patients and health services are considerable if complications are reduced.

Impact: Peripheral intravenous complications interrupt important treatment which can be distressing for patients and result in longer hospital stays with increased healthcare costs. This review found phlebitis and infiltration are the most prevalent reason for catheter failure. These results provide nurses with a strong evidence base for the development of effective interventions for practice which are vital for preventing poor outcomes for patients with peripheral intravenous catheters.
Reference: