The reported incidence of peripheral intravenous catheter (PIV) failure has been as high as 69%. This is in part due to inadequate stabilisation or securement to the skin, which allows micro-motion of the catheter within the vein” Marsh et al (2018).

Abstract:

BACKGROUND: The reported incidence of peripheral intravenous catheter (PIV) failure has been as high as 69%. This is in part due to inadequate stabilisation or securement to the skin, which allows micro-motion of the catheter within the vein.

METHODS: A pilot open randomised controlled trial of 300 patients was conducted in the medical and surgical wards of a large tertiary hospital. A superiority parallel pragmatic design was used. Eligible patients over the age of 16 years were randomised using a centralised service (randomly varied block sizes and 1:1 ratio) to have PIV dressings of either (i) a bordered polyurethane dressing (BPU, standard care) or (ii) the integrated securement device (ISD). Allocation was concealed until entry. The primary outcome of feasibility addressed eligibility, consent, protocol adherence and retention rates. All-cause PIV failure was an additional primary outcome. This was a composite of infection (laboratory-confirmed local or bloodstream infection), occlusion or infiltration, dislodgement, phlebitis and thrombosis. Group comparisons were by proportions, incidence rates per 1000 PIV days and hazard ratios. Secondary outcomes were local or bloodstream infection, occlusion or infiltration, dislodgement, phlebitis, thrombosis, PIV dwell time, safety and adverse events and patient
satisfaction with study products. Analysis was by intention to treat and the patient was the unit of measurement. Multivariable modelling was undertaken.

RESULTS: Feasibility outcomes were 91% of screened patients were eligible, 98% of invited patients consented, 100% of randomised participants received the allocated intervention on insertion and 1/300 (<1%) were lost to follow-up. In total, 792 PIV days were studied. PIV failure occurred in 43/150 BPU patients (29%) and 40/150 ISD patients (27%) (119 vs 93 per 1000 PIV days; incidence rate ratio 0.78, 95% confidence interval, CI 0.50-1.23). In the multivariate model, ISD (hazard ratio 0.51, 95% CI 0.29-0.89) and admission for a surgical emergency were significantly associated with decreased failure, while female gender, wound, hand insertion and more frequent PIV use were significantly associated with increased PIV failure. CONCLUSION: ISDs were significantly associated with decreased failure in the multivariable modelling. Feasibility outcomes were supportive of the need to undertake a larger trial to confirm these results. TRIAL REGISTRATION: Australian New Zealand Clinical Trials Registry, ACTRN12616000984493 . Registered 27 July 2016.

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