
Abstract:

A repeatable and sensitive method to evaluate the effect of three antiseptics and two disinfection techniques on viable microorganisms on luer-activated catheter needleless connectors (NCs) was developed. NCs were inoculated with Staphylococcus epidermidis or Klebsiella pneumoniae and disinfected with 3.15% chlorhexidine gluconate + 70% isopropanol (CGI), 70% isopropanol (IPA), or 10% PVP povidone iodine (PI) antiseptic pads using: a) scrubbing the NC septum and threaded external surfaces or b) wiping only the surface of the septum. Treatments were also evaluated against NCs pretreated with human serum and exposed for 18 hours to S. epidermidis prior to testing. Viable cells were quantified by plate count. The method for inoculation and recovery of luminal microorganisms was repeatable (SD, 0.31; n=28). IPA disinfection provided an approximate 3 log10 CFU reduction; CGI and PI provided 3 – 4 log10 reductions. PI and CGI were more effective than IPA (p<0.05), but differences between CGI and PI were not significant for either disinfection method. IPA, but not CGI and PI was also less effective (p<0.05) against NCs inoculated with K. pneumoniae than S. epidermidis. Pretreatment with serum and prolonged S. epidermidis inoculation removed the advantage seen with CGI and PI; log10 reductions were 1.80, 1.73, and 2.50 for CGI, PI, and IPA, respectively. PI or CGI may be more effective than IPA for NC disinfection but effectiveness may be reduced on NCs contaminated with blood or serum.