




Original Article

In vitro assessment of isopropanol leakage from antiseptic barrier caps into commonly used needleless connectors

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Abstract

Background: Needleless connectors (NCs) can be disinfected using antiseptic barrier caps (ABCs) to reduce the risk of catheter-related bloodstream infections. However, recent evidence suggests that isopropanol can leak from the ABC into the NC, posing concern about their safe use. We sought to determine in vitro which ABC and NC parameters influence the leakage of isopropanol through the infusion circuit.

Methods: We assessed 13 NCs and 4 ABCs available in the European market. In vitro circuits consisting of an isopropanol cap, a NC, and an 11-cm catheter line were created. The circuits were left in place for 1 to 7 days at room temperature to assess the kinetics of isopropanol leakage. Isopropanol content in ABC and in circuit flushing solutions (5 mL NaCl 0.9%) after exposure to the cap were measured using gas chromatography with a flame ionization detector.

Results: The leakage of isopropanol from the cap to the NC was dependent on the NC, but not the cap. The NC mechanism did not predict the leakage of isopropanol. The Q-Syte NC exhibited the most isopropanol leakage (7.01 ± 1.03 mg and 28.32 ± 2.62 mg at 24 hours and 7 days, respectively), whereas the Caresite NC had the lowest isopropanol leakage at 7 days (1.69 ± 0.01 mg).

Conclusion: The use of isopropanol ABCs can cause isopropanol leakage into the catheter circuit according to NC parameters. Caution should be exercised when using these devices, especially in the pediatric and neonatal population.

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