Best clinical practice of disinfection in intravenous device therapy contaminated with *Klebsiella pneumoniae*

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Background: *Klebsiella pneumoniae* is a Gram-negative bacteria. The treatment of infections from this bacteria in children is more challenging due to limited appropriate antibiotic use in this specific group (Akturk et al., 2016). Evidence-based research is necessary to understand best practice methods for the decontamination of needle-free devices (Kelly et al., 2017) such as network cables intravenous therapy newborn access (Polifix® - B Braun). It is necessary to verify the best method to disinfect needleless connectors, by developing evidence-based research.

Aim: To verify the effectiveness of two different chemical disinfection methods in reducing the bacterial load of *Klebsiella pneumoniae* in the Polifix® for peripheral venous catheters.

Methods: Experimental research. Polifix® were contaminated with 0.5 McFarland in the proportion 1:100CFU/ml in 0.9%NaCl. Then, two disinfection methods were adopted: 70% Isopropyl Alcohol single-use cap (Site-scrub®) and 70% Ethanol alcohol in sterile gauze. The device passed thought vortex and ultrasonic bath 40kHz, for recuperation. Then, 100 µl of the solution was put on a plate with TSA and it was incubated for 24 hours at 35°C±1. The number of CFU was counted and the Kruskal-Wallis test was performed for data analysis.

Results: The total of 27 in vitro experiments were performed. The experience was significant, with a $p = 0.045169$. The comparison between 70% Isopropyl Alcohol single-use cap (Site-scrub®) and 70% Ethanol alcohol in sterile gauze showed a difference, where Site-scrub® had a median of 101.00 CFU and the other had 139.50 CFU per plate.

Conclusion: The two different chemical disinfection methods were effective to reduce bacterial load in Polifix® device. Although both reduced *Klebsiella pneumoniae* bacteria load, Site Scrub® showed better performance to reduce the CFU per plate. It is necessary to test the disinfection methods by clinical research as a next step.

Nursing Research, Evidence-Based Practice, Disinfection, Catheter-Related Infections, Pediatric Nursing.

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References

Akturk, Hacer, Sutcu, Murat, Somer, Ayper, Aydın, Derya, Cihan, Rukiye, Ozdemir, Aslı, Coban, Asuman, Ince, Zeynep, Citak, Agop, & Salman, Nuran. (2016). Carbapenem-resistant Klebsiella pneumoniae colonization in pediatric and neonatal intensive care units: risk factors for progression to infection. Brazilian Journal of Infectious Diseases, 20(2), 134-140. Available at: https://dx.doi.org/10.1016/j.bjid.2015.12.004

Kelly L, Jones T, Kirkham S. Needlefree devices: keeping the system closed. Br J Nurs. 2017;26(2):S14–9. Available at: https://www.magonlinelibrary.com/doi/full/10.12968/bjon.2017.26.2.S14