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Self-disinfecting sink drains reduce the *Pseudomonas aeruginosa* bioburden in a neonatal intensive care unit.

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Abstract

AIM: Water in sink drains is a known source of gram-negative bacteria. We aimed to evaluate the impact of self-disinfecting sink drains on the emission of aerosolised bacteria and on *Pseudomonas aeruginosa* acquisition among neonates.

METHODS: Aerosol bacterial growth and patient *Pseudomonas aeruginosa* acquisition rates were measured at baseline (Phase One), for 13 months after sinks were relocated or redesigned during refurbishment (Phase Two) and for 13 months after introducing self-disinfecting sink drains (Phase Three).

RESULTS: Cultures were positive for bacterial growth in 56%, 24% and 13% of the tested aerosols in Phases One, Two and Three, respectively. Comparing Phases Two and Three produced an odds ratio (OR) of 0.47, with a 95% confidence interval (CI) of 0.22-0.99 ($p = 0.047$), for all bacteria and an OR of 0.31 and CI of 0.12-0.79 ($p = 0.013$) for *Pseudomonas aeruginosa*. Rates of *Pseudomonas aeruginosa* positive clinical cultures were 0.34, 0.27 and 0.13 per 1000 patient days during the respective phases, with a significant increase of time to the next positive clinical culture in Phase Three.

CONCLUSION: Self-disinfecting sink drains were superior to sink replacements in preventing emissions from aerosols pathogens and may reduce hospital-acquired infections. The bioburden reduction should be confirmed in a larger multicentre trial.

KEYWORDS: Aerosolised bacteria; Gram-negative bacteria; Neonatal intensive care unit; Pseudomonas aeruginosa; Self-disinfecting sink drain

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