

Standardized comparison of antiseptic efficacy of triclosan, PVP–iodine, octenidine dihydrochloride, polyhexanide and chlorhexidine digluconate

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Abstract

Background This study presents a comparative investigation of the antimicrobial efficacy of the antiseptics PVP–iodine, triclosan, chlorhexidine, octenidine and polyhexanide used for pre-surgical antisepsis and antiseptic treatment of skin, wounds and mucous membranes based on internationally accepted standards.

Methods MICs and MBCs were determined in accordance with DIN 58940-7 and 58940-8 using *Staphylococcus aureus* (including methicillin-resistant *Staphylococcus aureus*), *Enterococcus faecalis* (including vancomycin-resistant *Enterococcus*), *Streptococcus pneumoniae*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Clostridium perfringens*, *Haemophilus influenzae* and *Candida albicans*. The microbicidal efficacy was determined in accordance with DIN EN 1040 and 1275 using *S. aureus*, *P. aeruginosa* and *C. albicans*.

Results For chlorhexidine, octenidine and polyhexanide, MIC₄₈ and MBC₂₄ ranged from 16 to 32 mg/L. Maximum values for triclosan ranged from 256 to 512

mg/L, with an efficacy gap against *P. aeruginosa*, while the maximum values of PVP–iodine were 1024 mg/L, with a gap against *S. pneumoniae*. Comparing the minimal effective concentrations, octenidine was most effective. After 1 min, only octenidine and PVP–iodine fulfil the requirements for antiseptics.

Conclusions Tests under standardized and harmonized conditions help to choose the most efficacious agent. When a prolonged contact time is feasible, ranking of agents would be polyhexanide = octenidine > chlorhexidine > triclosan > PVP–iodine. This is consistent with the recommendations for antisepsis of acute wounds. Polyhexanide seems to be preferable for chronic wounds due to its higher tolerability. If an immediate effect is required, ranking would be octenidine = PVP–iodine >> polyhexanide > chlorhexidine > triclosan.