EFFICACY OF VARIOUS TOPICAL ANTIMICROBIAL AGENTS IN DIFFERENT TIME PERIODS AFTER BACTERIAL CONTAMINATION OF BURN WOUND

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Aim: In vitro efficacy evaluation of eleven topical antimicrobial agents frequently used in our burn centre against six multidrug-resistant bacterial strains isolated from patients’ burn wounds.

Material and Methods: A simple and reproducible in vitro model was used to evaluate the effects of following topical antimicrobials: 1% silver sulfadiazine, 1% acetic acid, 0.2% nitrofurazone, povidone iodine solution, octenidindihydrochloride solution, chloride solution, 1% acetic acid+1% silver sulfadiazine, manuka honey dressing, 2 silver impregnated dressings and 1 dressing impregnated with silver and hyaluronic acid. Different wound models were created (freshly contaminated, 4hours, 6hours and 24hours from contamination). Survival of 6 bacteria – Pseudomonas aeruginosa (2strains), Staphylococcus aureus, Staphylococcus haemolyticus, Enterococcus faecalis and Escherichia coli – was evaluated 24-hours after application of the agents.

Results: The efficacy against all strains in planktonic form (freshly contaminated wound model) was excellent in the majority of the tested agents. The longer was the period between contamination and application of topical antimicrobial, the higher infectivity of the agents was observed. The highest efficacy from all the antimicrobials had povidone iodine and octenindihydrochloride.

Conclusions: Topical antimicrobial agents play an important role in treatment of burns, but they should be used according to their efficacy against bacterial strains in patients’ wounds. According to the results obtained 24 hours after bacterial contamination of the burn wounds, it was not possible to kill the bacteria using topical antimicrobial therapy only.