

Tropical Medicine 2018- Comparison of antiseptics' efficacy on bacterial infection prevention in hospital environment - Mohammad Hadi Dehghani - Tehran University of Medical Sciences

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In this study the efficacy of antiseptics on bacteria causing hospital infections has been studied. In this study the antimicrobial activity of Descocid, Korsorex basic, Mikrobac forte and persidin 1% was studied against bacteria causing hospital infections such as *Enterobacter aeruginosa* 1221 (NCTC 10006), *Staphylococcus epidermidis* (PTCC: 1435 (Cip81.55) and *Pseudomonas aeruginosa* Strain PAO1. Sensitivities of bacteria were determined by Minimum inhibitory Concentration (MIC) and Minimum bactericidal Concentration (MBC) antiseptics. In the second stage, the concentration of antiseptics was prepared according to the manufacturer's suggested protocol and the effect of antimicrobial agents were studied at the certain concentration and contact time. All disinfectants (Descocid, Korsorex basic, Mikrobac forte) concentration and contact time, Accordance with the manufacturer's brochure, had inhibitory effect on all bacteria. That this is consistent with the manufacturer's brochure. Persidin one percent in concentration of from 2 and 4 V/V % and exposure time 5 minutes could not inhibit the growth of bacterial. But at concentrations of 10 and 20% respectively 15 and 30 minutes exposure time, all three types of bacteria can be inhibited, which is consistent with the manufacturer's claims. In this study, the efficacy of antiseptics was determined with the Micro-dilution method recommended by the NCCLS. Korsorex basic, weakest antiseptics (the highest MIC) for the inhibition of three bacteria was determined. But Between all four antiseptics (according to manufacturer concentration), Only one percent Percidine 2 and 4 V/V % in consumer dilution and 5 minutes exposure time failed to inhibit the growth of *Pseudomonas aeruginosa*, *Staphylococcus epidermidis* and *Enterobacter aeruginosa*.

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in hospitals and other health care settings for a variety of topical and hard-surface applications. A wide variety of active chemical agents (biocides) are found in these products, many of which have been used for hundreds of years, including alcohols, phenols, iodine, and chlorine. Most of these active agents demonstrate broad-spectrum antimicrobial activity; however, little is known about the mode of action of these agents in comparison to antibiotics. This review considers what is known about the mode of action and spectrum of activity of antiseptics and disinfectants. The widespread use of these products has prompted some speculation on the development of microbial resistance, in particular whether antibiotic resistance is induced by antiseptics or disinfectants. Known mechanisms of microbial resistance (both intrinsic and acquired) to biocides are reviewed, with emphasis on the clinical implications of these reports.

Antiseptics and disinfectants are used extensively in hospitals and other health care settings for a variety of topical and hard-surface applications. In particular, they are an essential part of infection control practices and aid in the prevention of nosocomial infections (277, 454). Mounting concerns over the potential for microbial contamination and infection risks in the food and general consumer markets have also led to increased use of antiseptics and disinfectants by the general public. A wide variety of active chemical agents (or "biocides") are found in these products, many of which have been used for hundreds of years for antiseptics, disinfection, and preservation (39). Despite this, less is known about the mode of action of these active agents than about antibiotics. In general, biocides have a broader spectrum of activity than antibiotics, and, while antibiotics tend to have specific intracellular targets, biocides may

have multiple targets. The widespread use of antiseptic and disinfectant products has prompted some speculation on the development of microbial resistance, in particular cross-resistance to antibiotics. This review considers what is known about the mode of action of, and mechanisms of microbial resistance to, antiseptics and disinfectants and attempts, wherever possible, to relate current knowledge to the clinical environment.

A summary of the various types of biocides used in antiseptics and disinfectants, their chemical structures, and their clinical uses. It is important to note that many of these biocides may be used singly or in combination in a variety of products which vary considerably in activity against microorganisms. Antimicrobial activity can be influenced by many factors such as formulation effects, presence of an organic load, synergy, temperature, dilution, and test method. These issues are beyond the scope of this review and are discussed elsewhere.

“Biocide” is a general term describing a chemical agent, usually broad spectrum, that inactivates microorganisms. Because biocides range in antimicrobial activity, other terms may be more specific, including “-static,” referring to agents which inhibit growth (e.g., bacteriostatic, fungistatic, and sporistatic) and “-cidal,” referring to agents which kill the target organism (e.g., sporicidal, virucidal, and bactericidal). For the purpose of this review, antibiotics are defined as naturally occurring or synthetic organic substances which inhibit or destroy selective bacteria or other microorganisms, generally at low concentrations; antiseptics are biocides or products that destroy or inhibit the growth of microorganisms in or on living tissue (e.g. health care personnel handwashes and surgical scrubs); and disinfectants are similar but generally are products or biocides that are used on inanimate objects or surfaces. Disinfectants can be sporostatic but are not necessarily sporicidal.

Sterilization refers to a physical or chemical process that completely destroys or removes all microbial life, including spores. Preservation is the prevention of multiplication of microorganisms in formulated products, including pharmaceuticals and foods. A number of biocides are also used for cleaning purposes; cleaning in these cases refers to the physical removal of foreign material from a surface

Biography

Mohammad Hadi Dehghani (PhD) is a Full Professor at the Tehran University of Medical Sciences (TUMS), School of Public Health, Department of Environmental Health Engineering, Tehran, IRAN. His scientific research interests include the Environmental Health and Infectious Waste. He is the author of various research studies published at national and international journals, conference proceedings and Head of several research project at the TUMS. He has authored 8 books and more than 150 full papers published in peer- reviewed journals. He is an editorial board member and reviewer in many internal and international journals and is member of several international science committees around the world. He has supervisor and advisor PhD and MSc theses at the TUMS.

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