

ABSTRACT

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Title of diploma thesis: Sensitivity of multiresistant strains to disinfectants

Branch of study: Healthcare bioanalytics – Specialist in Laboratory Methods

Out of multiresistant strains (bacteria resistant to multiple antibiotics), are gradually becoming a bigger problem in all treatments of infectious diseases on a global scale. They can easily become a major complication, which could occur during medical care and following treatments. The requirement is to reduce their quantity, limit their reproduction and transmission between patients. One of the used resources are disinfectants.

The aim of this dissertation is to determine the sensitivity of selected multi-resistant strains against certain disinfectants, which are routinely used at Faculty Hospital in Hradec Králové. The following products used in the Department of Clinical Microbiology have been selected for testing: *Basic Manusept*[®] - ethanol disinfection used in practice for hygienic and surgical hand disinfection, *Sterillium Med*[®] - ethanol disinfection with the addition of glycerol, which is used for hygienic and surgical hand disinfection, *Cleanisept*[®] - combined disinfectant for disinfecting and washing diagnostic tools and surfaces, and *Descosept AF* - ethanol disinfection for disinfection of small surfaces, diagnostic tools and disinfection tools; also tested, were two disinfectant products from our IV. Hematology Clinic of the Faculty Hospital in Hradec Králové. *Softasept N*[®] - ethanol product used to disinfect the skin before blood collection, injections, punctures. As well as *Septoderm* - ethanol disinfection used as a hygienic and surgical hand disinfection, as well as a skin disinfection before injection operations.

The methods used to determine the effect of the selected disinfectants is based on the European standard **EN 1040**. It's about quantitative suspension test for the determination of bactericidal activity of chemical disinfectants. The method was modified by selecting multiresistant strains of gram-negative rods. To further test the reference strain of *Pseudomonas aeruginosa* CCM 7930, multi-drug resistant strains of *Pseudomonas aeruginosa* isolated from swabs of the environment at the University Hospital in Hradec Králové. Other multidrug-resistant strains were clinical isolates from patients hospitalized in

the University Hospital Hradec Králové: *Klebsiella pneumoniae* ESBL+, *Acinetobacter baumannii* and *Burkholderia cepacia* genomovar *multivorans*.

After gathering all the results, we have concluded that the disinfectants used in laboratories of ÚKM (*Manusept*[®] *Basic*, *Sterillium*[®] *Med*, *Cleanisept*[®] and *Descosept AF*) are sufficiently effective against all tested multidrug-resistant strains and also the reference strain of *Pseudomonas aeruginosa*. Disinfectants obtained from hematology clinics (*Softasept*[®] *N* and *Septoderm*) have shown a 100 % efficiency only in undiluted form against the reference strains of *Pseudomonas aeruginosa* and multi-resistant strains of *P. aeruginosa*, *K. pneumoniae*, and *B. cepacia*. The strain of *A. baumannii* MR has not been effective according to the criteria of EN 1040.

Key word: multidrug resistance – disinfectant – EN 1040 – *Acinetobacter baumannii* – *Klebsiella pneumoniae* – *Pseudomonas aeruginosa* – *Burkholderia cepacia*