

Promising *in vitro* effect of selected antiseptics against the pathogenic acanthamoebic strains identified in Polish patients with therapeutically complicated *Acanthamoeba keratitis* – a growing threat to human health worldwide

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Some *Acanthamoeba* sp. known as free-living amoebae of many environments may exist as facultative parasites; the protists generate a human health threat, among others, due to their pathogenic potential as causative agents of *Acanthamoeba keratitis* (AK), vision-threatening progressive human eye disease reported with increasing frequency mainly in contact lens wearers. The nonspecific symptoms of the disease, diagnostic mistakes delay an appropriate treatment; applied therapy is often unsuccessful due to differences in virulence of pathogenic strains and exceptional high resistance of the amoeba cysts to chemicals, disinfectants and drugs. The emerging threats generated by these amphizoic amoebae is the serious problem for the public health worldwide, for this reason, various agents are still examined in terms of their potential *in vitro* amoebicidal efficacy. In this study, the *in vitro* effects of selected antiseptics with possible activity against the pathogenic *Acanthamoeba* corneal strains were investigated in a comparison to an influence of the substances on the reference environmental strain. The study was performed in accordance with the tenets of the Declaration of Helsinki. Strains of corneal scrapings from two therapeutically complicated AK cases identified by molecular techniques, cultured in BSC medium; samples were exposed to the octenidine dihydrochloride (50µg/ml) and povidone iodine(5mg/ml).

Changes in overall number of amoebae, population dynamics, trophozoites/cysts proportion, survival time in cultures were monitored; all assays were analyzed statistically. Results of the comparison of obtained sequences with the available in GenBank confirmed PCR products as fragments of *Acanthamoeba* with 97–100% homology to T4 genotype. Results of the assays with antiseptics revealed time-dependent amoebostatic effect of the agents on amoebic strains with various degrees of effectiveness, differences in the susceptibility of particular corneal strains and in comparison to the *A. castellanii* Neff strain to agents, changes in population dynamics, a reduction in the total number of amoebae and in cyst's %. Detailed data on effectiveness of the chemicals against the amphizoic amoebae investigated are presented and variability in resistance /sensitivity of different *Acanthamoeba* strains discussed. It is noteworthy, that povidone

iodine solutions currently used as contact lens disinfectants and, also, as eye drops, may be promising drug in AK treatment; for this reason further studies with different dose of this agent and pathogenic amoebic strains are still necessary.