
ANALYSIS OF THE MECHANISM OF ACTION AND THE ANTIMICROBIAL ACTIVITY OF CERTAIN ANTISEPTICS AND DISINFECTANTS AGAINST *BACILLUS SPP.*, *ACINETOBACTER SPP.*, *KLEBSIELLA SPP.*, *SERRATIA MARCESCENS* AND *CANDIDA SPP.* AS ONE OF THE MOST COMMON CAUSES OF INTRA–HOSPITAL INFECTIONS

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Abstract: Undoubtedly, one of the biggest problems facing the modern medicine, as well as the healthcare management in the hospitals and the other healthcare facilities, is the emergence of intra–hospital or nosocomial infections. Namely, in the late nineteenth century, intensive development was evident in the medicine, and especially in the surgery, as one of the medical branches. As a result of such a development, certain basic standards in the field of hygiene in hospitals and other healthcare facilities have been established, microorganisms have been identified, and a major step has been made in the treatment of the most infections caused by microorganisms themselves. Despite such avant–garde changes, intra–hospital infections still remain a major cause of morbidity and mortality, which in a direct or indirect way cause an increase in hospital care costs and an increase in the incidence of new health risks in the community. It is for these reasons that intra–hospital infections are said to be not only a major problem for the modern medicine, but also a huge problem in the management of costs within a particular healthcare facility. The emergence of the resistance of microorganisms to antibiotics, as well as the emergence of new pathogens, which can be transmitted through different pathways, is due to the great advances made in pharmaceutical and medical biotechnology, on the one hand, and the irrational use of antibiotics, on the other hand. In addition, public pressure on healthcare facilities and the lack of properly trained staff additionally aggravates adequate control of intra–hospital infections. Also, many health professionals consider that the onset of the era of antibiotic use has greatly eliminated the possibility of intra–hospital infections. However, it is necessary to know that maintaining high–level hygiene in hospitals and other healthcare facilities is perhaps the most important step in the overall eradication of intra–hospital infections. Such high–level hygiene can be achieved by the proper use of antiseptics and disinfectants, commonly referred to as biocides. Namely, these compounds have the ability to directly destroy microorganisms or inhibit their growth, development and production. As such, antiseptics and disinfectants differ in that antiseptics are administered to living tissues, while disinfectants remove microorganisms from various objects, equipment or from the immediate environment. Proper use of antiseptics and disinfectants reduces the possibility of intra–hospital infections, which means that their improper use may result in the appearance of this type of infections.

The goals of this study are to present some of the most common microorganisms that cause the occurrence of intra–hospital infections; to present the mechanisms of action of the most frequently used antiseptics and disinfectants in hospital conditions; to give guidance as to which antiseptic or disinfectant would be most suitable for use against the microorganism which occurs in the function of the causative agent of the intra–hospital infection.

To accomplish these goals, as a method, we used the *Kirby–Bauer* disk–diffusion method and as a microbiological growth medium, we used *Mueller–Hinton* agar. The zone of inhibition, through which the antimicrobial activity is expressed, was measured using a ruler and expressed in millimeters (*mm*).

From the obtained results, we determined which antiseptic or disinfectant is best to be used against the microorganisms that were covered by this research.

Keywords: Benzalkonium chloride; Formaldehyde; Hydrogen peroxide; Ethanol; Boric acid; Povidone–iodine; Intra–hospital infections.