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Przedkładam streszczenie w języku angielskim pracy doktorskiej mgra Marcina Gacek pt.: „Wpływ cząstek srebra na strukturę i właściwości implantów wewnątrzgałkowych”.

ABSTRACT

The work has a classic structure divided into literature studies, theses and research part. At the end of the thesis there is a summary and conclusions as well as a list of literature used when writing the thesis. In the theoretical part, a lot of space is devoted to the characteristics of the materials from which intraocular implants are made. Their characteristics, history and reasons for their use were given. The structure and types of used intraocular implants were characterized. Due to the topic taken up, the issue of silver nanoparticles was discussed in the theoretical introduction. The methods of their production are presented and the forms in which these particles occur are described. Silver as a precious metal is widely used in many industries. The paper briefly presents the possible uses of silver with particular emphasis on medical applications. In addition, various possibilities for the use of silver were cited, including as elements of dressings or for water disinfection. The bactericidal and fungicidal properties of silver have been known for many years. Theoretical introduction gives examples of biocidal properties of silver nanoparticles.

The thesis is presented in the part of own research. The main assumption of the work is the lack of negative impact of the presence of silver nanoparticles on the optical properties of implants while improving their bactericidal and fungicidal properties. In order to prove the thesis, the original intraocular implants were subjected to bathing in two silver solutions differing in the concentration of particles. Four types of implants applied every day for patients were selected for the study: three implants made of acrylic (foldable implants, the so-called "soft") and one made of polymethyl methacrylate (PMMA, the so-called "hard").

A number of studies were carried out on the structure and properties of implants before and after bathing in a silver solution. The research methods used in this work have been characterized. The structure of the implants tested was examined using: X-ray diffraction, computed tomography, FTIR spectroscopy and scanning electron microscopy. The amount of silver particles adhered to the surfaces of the implants was determined using the chemical reduction method.

From the application point of view, the essence of the work is to determine the effect of silver particles on the optical and biological properties of intraocular implants. The optical properties of the implants were determined on the basis of UV-VIS and circular polariscope measurements. The influence of silver particles on the course of transmittance and absorbance of the electromagnetic wave in the examined area was determined based on measurements. The biological properties of implants were determined on the basis of the number of microorganisms counts adhered to the surface of the implants in their original condition and

after bathing in silver solutions. Original implants and those bathing in silver solutions were infected with three types of bacteria and one species of fungus. The most common microbes in postoperative complications: Staphylococcus ureus, Escherichia coli, Pseudomonas aeruginosa, and Candida albicans were selected for the study. The mechanical properties of implants were determined on the basis of creep tests.

Part of the research results presented in this work have been published in specialized scientific journal on the so-called Philadelphia List.

