

PHARMACOLOGICAL RESEARCH OF NEW SUNSCREEN WITH NANOPARTICLES OF CERIUM DIOXIDE

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Introduction. The skin protecting from ultraviolet radiation is a very important measure for the prevention of solar burn and other kinds of solar damage like dermatitis, erythema, skin aging and cancer. Unfortunately, today on the national market there is no photoprotectors able to compete with foreign developments. On the other hand, the climate and environmental situation in Ukraine requires the development of new effective photoprotectors. Especially photoprotectors are useful for the people having more than 4 birthmarks, military who serve in solar regions, people with the genetic predisposition to skin cancer, the patients receiving phototherapy. Also there are many substances reinforcing the negative impact of ultraviolet radiation on the skin, including drugs (sulfanilamidums, GCS, antibiotics, COCs, hypoglycaemic drugs, neuroleptics).

Aim. The main task in this research was the study of efficiency of new sunscreen with nanoparticles of cerium dioxide in comparison with popular cosmetic sunscreen Biokon SPF 40.

Materials and methods. In this research we use the model of UV-erythema modified with phototoxic reaction at guinea pigs divided by 7 groups (10 animals in everyone). All animal were shaved on identical sites along a back ($S=3\text{cm}^2$). Irradiation was done by UV-lamp at the distance 10 cm from animals, a radiation time was 10 minutes, UV-range was 240-320 nm. We used solution for external application «Ammifurin» 0.3% as a photosensitogen (1 ml in 1 hour before radiation). The sunscreens were put in 20 min. before to radiation.

Results and discussion. The results show that the cream with nanoparticles of cerium dioxide was more effective than sunscreen Biokon SPF 40 by 10%. It could reduce negative consequences of UV-radiation by 43%, and in terms of photosensitivity – by 31%. The experimental data prove that the cream with nanoparticles of cerium dioxide has photoprotective, antioxidant and anti-inflammatory properties.

Conclusions. Corollary, sunscreen with nanoparticles of cerium dioxide is more effective than the reference-agent Biokon SPF 40. This research still needs advanced preclinical and clinical studies, but now it is possible to say that this cream can be new perspective development of domestic photopharmacology, and can become a perspective commodity for the import substitution.