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Nanocationite [25Mg]PMC16: Experimental research of topical use in adrenalin induced glaucoma

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Mitochondrial oriented medicines are perspective for the glaucomatous optic neuropathy treatment. Fullerene-based low toxic nanocationite particles (PMC16) with $^{25}\text{Mg}^{2+}$ belong to the abovementioned group. Nanoparticles of a magnetic isotope of magnesium ($^{25}\text{Mg-PMC}_{16}$) are characterized by low toxicity and membranotropic antioxidant effect. Positive antiapoptotic and antioxidant effects of Mg, fullerene, and porphyrin that exist within structure of this nanoparticle have been previously known. The aim of the work was to determine the opportunity of the intraocular use of $^{25}\text{Mg-PMC}_{16}$ in healthy rabbits (10 μg , 100 μg and 1000 μg) and in case of adrenalin induced glaucoma (10 μg) as well as intraocular pressure (IOP) dynamics and eye tissue reaction for the intracameral and intravitreal injection of $^{25}\text{Mg-PMC}_{16}$. The eyes were characterized *in vivo* by means of biomicroscopy and direct ophthalmoscopy, post mortem - by light microscopy, IOP was measured by Maklakov tonometer. Results: there were no inflammation or toxic reaction by *in vivo* control and histologic examination in all doses of the nanocationite. Temporal mild IOP increase was found in the case of 10 μg of PMC16 with

Mg $^{25+}$ use in the group of rabbits without ocular hypertension, and IOP decreased in rabbits with ocular hypertension. Conclusion: the dose 10 μg of nanocationit PMC16 with Mg $^{25+}$ is safe (induce no inflammation or toxic reactions) for the intracameral and intravitreal use and does not opacificate optic media, decreasing intraocular pressure in the eyes with elevated IOP and moderately increasing it in the eyes with low IOP during the period of 14 days after the injection.

Biography

Alyabyeva Zhanna Yurievna has completed her PhD in Ophthalmology as well as postdoctoral studies at Pirogov Russian National Research Medical University. She worked as a professor of ophthalmology in National Medico-Surgical Center by N.I. Pirogov and practicing ophthalmologist in Moscow Glaucoma Center, now she is a leading researcher in the Scientific Research Group of Glaucoma and Dystrophic Eye Disease (Pirogov Russian National Research Medical University) and laser surgeon in Laser Ophthalmology Department (Moscow City Hospital #15 named by O.M. Filatov). She has published more than 50 papers in reputed journals.

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