

A Strategy Therapy for Retinitis Pigmentosa Induced by Argon Laser in Rabbits by High Dose Adult Stem Cells

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Abstract : Aim: The purpose of this study is to regenerate the damaged photoreceptor cells as a result of argon laser as a model of Retinitis Pigmentosa in rabbits' retina by using adult stem cells from rabbits' bone marrow. Background: Retinitis pigmentosa (RP) is a group of inherited disorders that primarily affect photoreceptor and pigment epithelium function. RP leads to loss of the rod outer segment and shorten the photoreceptor layer and expose the photoreceptor cell body to high-pressure levels in oxygen (oxidative stress) leads to apoptosis to the rod and cone cells. In particular, there is no specific treatment for retinitis pigmentosa. Materials and Methods: Forty Two Giant (Rex) rabbits were used in this experiment divided into 3 groups: Group 1: Control (6 rabbits), Group 2: Argon laser radiated as a model of retinitis pigmentosa (12 rabbits), Group 3: Laser radiated and treated by 6 million stem cells (12 rabbits). The last two groups are divided each into two subgroups each subgroup contains 6 rabbits, the ophthalmological examination was performed on rabbits, blood samples and retina samples were taken after 25 days and after 36 days from the laser radiation (10 days and 21 days after stem cells insertion in group 3) to perform the biochemical analysis. Results: Compared to control Group, a decrease of ERG wave amplitude and antioxidant substances (Glutathione) in blood and retina in group 2, and an increase of oxidative stress substances (Nitric oxide, Malonaldehyde, and carponyl protein) and apoptotic substances (Advanced glycation end product and M-metalloproteinase) in blood and retina. Compared to group 2, mostly increases of antioxidant substances and ERG wave amplitude in group 3, and mostly decreases in oxidative stress substances and apoptotic substances. Conclusion: Insertion of 6 million stem cells intravitreal gives good results in regeneration of the damaged photoreceptor cells after 21 days.

Keywords : retinitis pigmentosa, stem cells, argon laser, oxidative stress, apoptosis

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