



THERAPEUTIC EFFECT OF MELATONIN ON ENDOTOXIN-INDUCED UVEITIS IN THE GOLDEN HAMSTER

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Abstract

Uveitis is an inflammatory process that affects primary the uveal tract, but may reach the retina, causing a deficit of visual function. The disease is mainly due to the damage generated by leukocyte infiltration which releases cytokines and other inflammatory mediators, like arachidonic acid metabolites, reactive oxygen species, nitric oxide (NO), and superoxide anion, among others. Several evidences support that melatonin inhibits the retinal nitridergic pathway activity, decreases the synthesis of prostaglandins and is a potent antioxidant. We have developed an experimental model of uveitis in golden hamsters through the intravitreal injection of bacterial lipopolysaccharide (LPS). The aim of this work was to examine the therapeutic effect of melatonin on endotoxin-induced uveitis. For this purpose, melatonin was administered through a subcutaneous pellet of 20µg. Clinical observation (conjunctival hyperemia, alterations of episcleral vessels, cornea, iris, crystalline and posterior segment) was analyzed by assigning a score to each of these signs (maximum: 16 points). In order to evaluate the state of the hemato-ocular barrier, the number of infiltrating cells and protein content were assessed in aqueous humor. In addition, retinal nitric oxide synthase (NOS) activity was measured through the conversion of 3H-arginine to 3H-citrulline. To analyze retinal function, electroretinograms were registered in scotopic conditions. The results indicate that melatonin decreased the clinical score (LPS vs melatonin + LPS, $p < 0.05$, Mann Whitney's test) and it significantly reduced the concentration of proteins and the number of infiltrating cells. Retinal NOS activity significantly decreased in the presence of melatonin. In addition, the methoxyindole reverted the decrease in ERG a- and b-wave amplitude induced by LPS (LPS vs melatonin + LPS, $p < 0.01$, Tukey's test). In summary, these results indicate that melatonin significantly reduced clinical, biochemical, and functional alterations induced by LPS. Therefore, melatonin could be considered a new therapeutic strategy in uveitis treatment.

Keywords

melatonin, bacterial disease, nitric oxide

REDUCED CHOROIDAL BLOOD FLOW CAN INDUCE VISUAL FIELD DEFECT IN OPEN ANGLE GLAUCOMA PATIENTS WITHOUT INTRAOCULAR PRESSURE ELEVATION FOLLOWING ENCIRCLING SCLERAL BUCKLING

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Abstract

Purpose. To investigate the tissue blood flow in the neuroretinal rim of the optic disc and macula after rhegmatogenous retinal detachment (RRD) surgery. Design. Observational cross-sectional study. Methods. Tissue blood flow in the neuroretinal rim of the optic disc and macula was measured with the Heidelberg retina flowmeter in 53 eyes of 53 patients who had undergone successful surgery for unilateral RRD. Patients were divided into three groups; those who had the RRD treated by conventional encircling scleral buckling (Group E), by local buckling (Group L), and by primary vitrectomy (Group V). Blood flow measurements were made more than 6 months after surgery in a 10°x2.5° area of the superior and inferior margins of the neuroretinal disc rim and of the superior and inferior macula area. The mean blood flow (MBF) and the ratio of the MBF in the affected eye to the healthy fellow eye (a/f ratio) were compared among the three groups. The influence of several clinical factors on the MBF was also investigated. Results. The MBF rate and mean a/f ratios of the MBF of the three groups were not significantly different. Multiple regression analysis revealed that the averaged MBF both at superior and inferior disc rims was significantly correlated with only the gas tamponade procedure. Conclusions. The ocular microcirculation is normal 6 months after scleral buckling or vitrectomy for RRD. However, the use of gas tamponade might have a subclinical adverse effect on the circulation in the neuroretinal disc rim.

Keywords

retinal detachment, blood supply, vitreoretinal surgery

OCULAR STIFFNESS MEASUREMENT USING GOLDMAN APPLANATION TONOMETER

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Abstract

Purpose: Corneal stiffness is reported to affect the measurement of intraocular pressure (IOP). The purpose of this study is to develop ocular stiffness measurement using Goldmann applanation tonometer (GAT) and to examine the correlation with eye parameters. Methods: In 16 healthy subjects (9 males and 7 females 32.3±5.7years) eye parameters including IOP, central corneal thickness (CCT), and corneal curvature (CC) were measured by GAT by the same physician and the deformation of cornea by the tip of GAT was recorded using a high sensitive camera. Ocular stiffness was calculated by the analysis of cornea deformation. The correlation between ocular stiffness and eye parameters was examined in the multivariate analysis. Results: Ocular stiffness measured by GAT was 100.2 +/- 19.1 N/m (range: 70.8 N/m to 139.5 N/m) and there were individual differences between subjects. IOP, CCT, and CC were 14.6 +/- 2.0 mmHg, 0.532 +/- 0.024 mm, 7.80 +/- 0.23 mm, respectively. Ocular stiffness was significantly correlated with IOP ($p=0.02$), but not with CCT ($p=0.27$) or CC ($p=0.15$). Conclusion: Ocular stiffness, which we defined in this study, depends mainly on IOP but there were individual differences in ocular stiffness. Other eye parameters such as ocular-elasticity may affect ocular stiffness.

Keywords

cornea: clinical science, intraocular pressure, anterior segment

DEVELOPMENT OF HANDHELD VIDEO SYSTEM FOR RETINAL EXAMINATION WITH CONTACT LENS

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Abstract

Purpose: In order to develop an inexpensive, easy-using handheld video system for the retinal examination with conventional contact lens. Methods: Volk SuperQuad 160 and Quad Pediatric indirect contact laser lenses were chosen for the system development. PCB-mounted Sony SuperHAD CCD chip was used for the acquisition of retinal image. Coaxial illumination was provided by white LED light through mirror-type plate beam splitter which has the characteristics of 30% reflection and 70% transmission. Retinal image was monitored with conventional video monitor, and captured by computer or digital video. Proposed system was tested in New Zealand white rabbits under general anesthesia. Results: Handheld video system was successfully developed by proposed methods. Wide field retinal images were clearly captured in still or motion pictures with the resolution of 640 x 480 pixels. The dimension of the developed system was 40 mm x 40 mm x 120 mm and it could be easily integrated and disassembled with the selected lenses for exchange. White LED light provided enough illumination for the examination of the retina and generated negligible heat. Conclusion: Proposed system was easy to use and provided good retinal image for the examination. It can also be modified to take images of other contact-type examination lenses. This system could be useful for the screening of the various retinal diseases such as retinopathy of prematurity. Acknowledgement: This work was supported by grant No. R01-2005-000-10875-0 from the Basic Research Program of the Korea Science & Engineering Foundation and by grant No. A060673 from Ministry of Health and Welfare of Korea

Keywords

imaging methods (CT, FA, ICG, MRI, OCT, RTA, SLO, ultrasound), retina