

Relations between optical nerve damage, intrCular pressure and in vivo ocular tissue properties monitoring strategies for glaucoma diagnosis and prevention

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Summary

The eye is a biomechanical organ where the health of the optical nerves and vision are affected by the intrCular pressure and the ocular tissue structure. The ocular pressure is the primary parameter monitored by opticians and ophthalmologists to determine the ocular health of the eye to prevent glaucoma where 50% of the vision can be lost before detection by the patient. Elevated intrCular pressure is clinically correlated with the degeneration of the optic nerves, but the biomechanical mechanism for the degeneration remains speculative. In this study, we present the results from biomechanical modeling of nerve damage as a function of age and intrCular pressure. The intrCular pressure and the elastic moduli of ocular tissues are shown to be important factors in nerve damage. Continuous contact lens-based in vivo method to measure the intrCular pressure and in vivo methods to measure the elastic properties of tissues are developed to measure and monitor these factors in vision health. The use of these new innovative biomechanical-based techniques for risk assessment and monitoring of glaucoma are discussed.

