αB -crystallin (αBC) belongs to the family of small heat shock proteins that are necessary for maintaining oxygen homeostasis. This study was designed to explore the possible effects of αBC on N-methyl- N-nitrosourea (MNU) induced retinal degeneration and the underlying mechanisms.

METHODS: The αBC was injected into the vitreous bodies of MNU administered mice. The retinal morphology and visual function of experimental animals were analyzed by electroretinography (ERG), Spectral domain optical coherence tomography (SD-OCT), fundus photographs, optokinetic testing and immunohistochemistry assay.

Optokinetic behavioural tests and ERG examination suggested that the visual impairments of the MNU administered mice were ameliorated effectively by αBC treatment. OCT analysis showed that the major retinal architecture of the MNU administered mice was efficiently rescued by αBC treatment. Fundus examination suggested that the lesion size of the MNU administered mice was decreased by αBC treatment. MNU induced photoreceptor loss was also mitigated by αBC treatment as shown by hematoxylin and eosin staining. In particular, the immunostaining study suggested that M-cone photoreceptors, rather than the S-cone photoreceptors, were preferentially rescued, indicating that the photoreceptor populations have different sensitivities to αBC. The mechanism study suggested that the anti-apoptotic, anti-oxidative and neurotrophic function of αBC collectively contributed to these therapeutic effects.

Intravitreal delivery of αBC could alleviate MNU induced photoreceptor degeneration and visual impairment. Further refinement of the αBC induced protection would afford a novel therapeutic strategy for retinitis pigmentosa [1)].

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Tao Y, Ding L, Yao A, Yang Z, Yang Q, Qin L, Yu L, Gao Y, Huang YF, Li Z, Teng D. Intravitreous Delivery of Ab-Crystallin Ameliorates N-Methyl-N-Nitrosourea Induced Photoreceptor Degeneration in Mice: An in vivo and ex vivo Study. Cell Physiol Biochem. 2018 Aug 15;48(5):2147-2160. doi: 10.1159/000492557. [Epub ahead of print] PubMed PMID: 30110696.