EFFECTS OF BNN27, A NOVEL SYNTHETIC MICRONEUROTROPHIN, ON EXPERIMENTAL RETINAL INJURY
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Purpose: The microneurotrophin BNN27 is a synthetic neurotrophin that passes through the blood-brain barrier and interacts with nerve growth factor receptors, TrkA and p75\textsuperscript{TR}. In this study, we investigated the potential neuroprotective effect of BNN27 on retinal cell death in two experimental murine models of retinal injury. Methods: Retinal detachment (RD) was induced by a subretinal injection of sodium hyaluronate. N-Methyl-D-aspartate (NMDA)-mediated excitotoxicity was induced by an intravitreal injection of NMDA. BNN27 was administered intraperitoneally after injury. Animals were euthanized 1 day later and cell death was assessed by TUNEL. Total photoreceptor cell death was analyzed comparing the outer nuclear layer/inner nuclear layer ratio 7 days post RD. Inflammatory cell infiltration and gliosis were examined by immunofluorescence while TrkA and/or p75\textsuperscript{TR} expression was evaluated by western blot. Results: Systemic administration of BNN27 significantly decreased the TUNEL-positive cell death 1 day post RD but was not able to offer neuroprotection 7 days later. Furthermore, both macrophage/microglia infiltration and gliosis were increased following BNN27 treatment at 24 hours post RD. In NMDA-mediated excitotoxicity, BNN27 was able to protect exclusively the photoreceptors and not the ganglion or amacrine cells 24 hours post injury, whereas did not significantly change the inflammatory cell infiltration or gliosis. In both models, there was no significant upregulation of TrkA and/or p75\textsuperscript{TR} receptors. Conclusions: Together, these findings can not demonstrate the neuroprotective activity of BNN27 in experimental retinal injury. Further studies are needed in order to elucidate the paradox of these results. Financial Disclosure: No