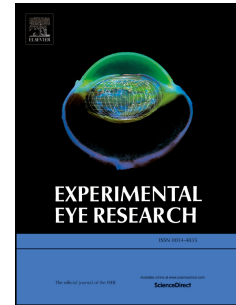


# Accepted Manuscript

Comparative analysis of retinal ganglion cell damage in three glaucomatous rat models

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# 1 Comparative analysis of retinal ganglion cell damage in three glaucomatous rat 2 models

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## 16 17 18 Abstract

19  
20 Progressive retinal ganglion cell (RGC) death is the major cause of retinal nerve fiber layer  
21 thinning and visual field defects in glaucoma. The purpose of this study was to compare RGC  
22 damage in three commonly used glaucomatous rat models. These models were generated by (i)  
23 injection of paramagnetic microbeads into the anterior chamber; (ii) cauterization of three  
24 episcleral veins of the eye (EVC); and (iii) intravitreal injection of N-Methyl-D-Aspartate  
25 (NMDA). Intraocular pressure (IOP) was measured with a rebound tonometer at 6, 12, and 18  
26 hours; 1, 3, and 5 days; and 1, 2, 3, 4, 6, and 8 weeks. We measured the RGC density of the three  
27 glaucomatous models in the flat-mounted retina by immunofluorescence. Subsequently, the  
28 thicknesses of both retinal ganglion cell layer (GCL) and inner retinal layer (IRL) were analyzed  
29 by hematoxylin and eosin staining of retinal sections. The visual functional deterioration was  
30 evaluated by measurement of the photopic negative response (PhNR) of different models.  
31 The IOP averages during three weeks were 22.35±1.23 mmHg (mean±SD), 20.91±1.97 mmHg,  
32 and 9.67±0.42 mmHg, with 50.2%, 44.00% and 66.76% RGC loss by 8 weeks, respectively, in the  
33 microbead group, EVC group and NMDA group. Decreased thickness in the GCL was observed  
34 in all three groups, while the thickness of IRL and ONL was decreased in the EVC and NMDA

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