Research paves the way for new anti-fibrotic therapy for glaucoma

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Acute angle closure glaucoma of the right eye (intraocular pressure was 42 in the right eye). Credit: James Heilman, MD/Wikipedia

Scientists at the University of Birmingham, UK, have shown that a novel low molecular weight dextran-sulphate, ILB could play a key role in treating open angle glaucoma (OAG), a neurodegenerative disease that affects over 70 million people worldwide and causes irreversible blindness.

OAG develops slowly over many years. Excessive matrix deposition (fibrosis) within the eye's main fluid drainage site can lead to increased intraocular pressure (IOP), resulting in damage to the optic nerve.[1]

The research, reported in *npj Regenerative Medicine*, has shown that that ILB can normalise matrix deposition inside the eye and lower IOP in a pre-clinical model used to mimic these aspects of human glaucoma, paving the way for new anti-fibrotic therapies to be developed for the disease.

OAG is a complex disease and it has proved difficult to develop effective therapeutics to target the biochemical pathways involved. Existing therapies mainly work by reducing fluid production in the eye, not the underlying causes, and even the newer therapies have shown limited success in the clinic.[2]

The Birmingham scientists focussed on an inflammatory pathway that is common to several diseases, and involves Transforming Growth Factor ? (TGF?), a signalling molecule that communicates between cells and orchestrates both inflammation and fibrosis. TGF?'s role in OAG is well known, with patients demonstrating higher levels in their aqueous humour and laboratory studies showing that artificially increasing TGF? within the eye can lead to fibrosis[3,4].

The scientists found that ILB has multimodal actions across many genes that resolve inflammatory and fibrotic cellular processes. When they progressed their work into a pre-clinical experimental model of glaucoma, they found that daily subcutaneous injections of ILB significantly (p