

Immune response may be the culprit behind vision loss in glaucoma.

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Abstract

Aqueous humour, a transparent fluid is found in the front of the eye. The eye is nourished and given shape by this fluid. This fluid is continuously produced by the eye and then removed by a drainage system. The fluid drains from the eye too slowly as a result of glaucoma. The accumulation of fluid causes an increase in internal eye pressure. If this pressure is not decreased, it may harm the tissues of the eye, including the optic nerve, which would impair vision. Glaucoma frequently affects both eyes, though occasionally one eye is more severely affected than the other. Many people are affected by glaucoma.

Keywords: Eye, Vision, Eye pressure, Eye illness, Glaucoma

Description

The term "glaucoma" refers to an increase in intraocular pressure that harms the optic nerve [1]. The front of the eye contains the translucent fluid known as aqueous humour. This fluid gives the eye its form and nourishes it. The eye continuously produces this fluid, which is then eliminated *via* a drainage system. Glaucoma causes the fluid to drain from the eye too slowly [2]. The pressure inside the eye rises as a result of the fluid build-up. If this pressure is not reduced, it could injure the eye's optic nerve and other tissues, which would make it difficult to see. Even though it sometimes affects one eye more severely than the other, glaucoma often affects both eyes. Glaucoma affects a lot of people. White people over the age of 60 are most susceptible, followed by Black and Hispanic people over the age of 40. The most prevalent form, open angle glaucoma, has slow onset and difficult to notice symptoms. But during an eye exam, an ophthalmologist might spot alterations. Glaucoma cannot be cured, although treatment can reduce or halt its progression [3]. According to a recent US study, glaucoma may be related to an immune system problem. The discovery might result in brand new, more potent medicines for the widespread vision threatening eye illness.

Immune cells: Researchers from Massachusetts eye and ear and Massachusetts institute of technology discovered in a mouse study that some immune cells (T cells) that are ordinarily unable to enter the eye are able to sneak through and harm the retinal cells.

Chen discovered that individuals with glaucoma have these immune cells five times more frequently than those who do not. The finding led the researchers to hypothesise that glaucoma may be brought on by the body's immune system wrongly targeting eye cells in response to a bacterial infection.

According to Chen, when too much pressure builds up in the eye, it triggers the development of a class of proteins called

heat shock proteins, also known as stress proteins, which are important in some immunological responses [4].

Memory T cells, an immune cell type that quickly reacts to the production of these proteins, assault the retinal ganglion cells, a type of neuron that receives visual signals from photoreceptors and sends them to the brain to be interpreted.

The optic nerve is harmed as a result of the T cells' onslaught and vision loss ensues: The first thing the researchers did was examine glaucoma mouse models. They examined three distinct groups of mice with this eye condition: One without T cells, one lacking B cells (a subset of white blood cells that play a role in immunity) and one lacking both T cells and B cells.

New developments: The focus of current glaucoma treatments is on reducing eye pressure, however some patients continue experience worsening symptoms even after the pressure is reduced.

As a result of the immune system's connection to glaucoma being discovered, new techniques to preventing and treating the disease may be created that stop this autoimmune activity.

The researchers are also examining whether the same immune system function may be responsible for other brain illnesses, such as Alzheimer's and Parkinson's disease.

References

1. Chen H, Cho KS, Vu THK, et al. Commensal microflora induced T cell responses mediate progressive neurodegeneration in glaucoma. *Nat Commun.* 2018;9(1): 3209.
2. Forrester JV, Xu H. Good news-bad news: the Yin and Yang of immune privilege in the eye. *Front Immunol.* 2012;3:338.

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3. Wang L, Wei X. T Cell mediated autoimmunity in glaucoma neurodegeneration. *Front Immunol.* 2021;12:803485.
4. Lakhundi S, Siddiqui R, Khan NA. Pathogenesis of microbial keratitis. *Microb Pathog.* 2017;104:97-109.

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