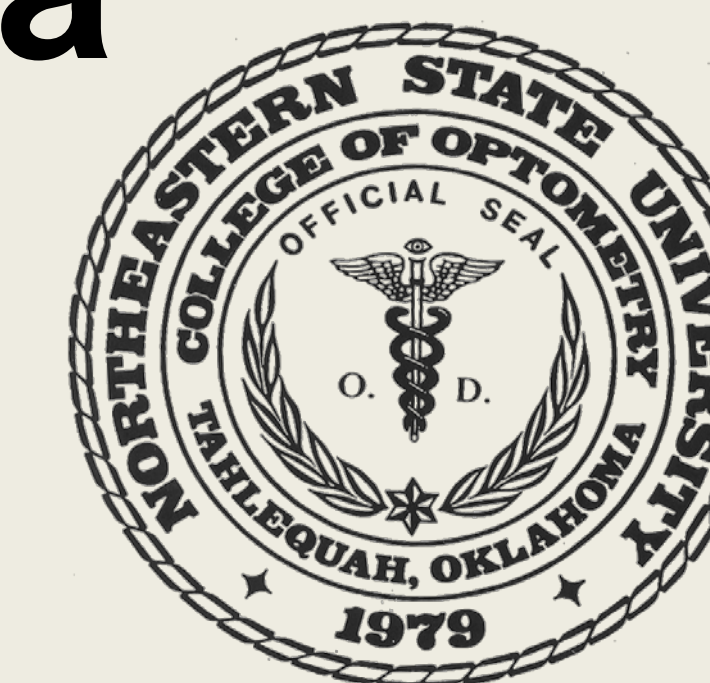


# Correlation Between Gastrointestinal Disorders and Glaucoma

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## Purpose

Comparison of glaucoma patients with non-glaucoma patients to determine a correlation between glaucoma and irritable bowel disease (IBD).

## Introduction

The direct cause of glaucoma is currently unknown, however, many hypotheses exist. One cause that has not been fully researched is the role the gastrointestinal tract (GIT) in the induction of glaucoma and other neurological disorders. The GIT and the central nervous system have several similarities and are more connected than previously thought. Infections of the gastrointestinal tract (GIT) may be contributing to the CNS damage seen in various neurodegenerative disorders. The bidirectional connection between the gastrointestinal tract (GIT) and central nervous system (CNS) may be allowing inflammatory mediators to travel from the gut to the brain and induce a cascade of events causing neuroinflammation and neurodegeneration. Inflammatory components have been hypothesized to directly link increased intraocular pressure (IOP) and ischemia with retinal ganglion cell (RGC) loss.

## Methods

A chart review was conducted of 81 randomly selected glaucoma patients with 81 non-glaucoma patients. The differences between sets was evaluated using an odds ratio. Using this data, a Pearson's chi square calculation was completed.

## Results

Of the glaucoma subjects, 25.9% had IBD or a related medication and of the control group, 22.2% had IBD or a related medication.

Table 1.  
Glaucoma and irritable bowel disease data analysis.

Group	No IBD	Yes IBD	Total
Glaucoma	60 74.1%	21 25.9%	81 100.0%
Control group	63 77.8%	18 22.2%	81 100.0%
Total	123 75.9%	39 24.1%	162 100.0%

## Discussion

Following the statistical analysis of the data, the risk of having irritable bowel disease (IBD) was only slightly higher for the subjects with glaucoma and was not statistically significant.

These findings indicate further research is indicated to study the role the bi-directional pathway between the gastrointestinal system and the central nervous system plays in glaucoma. Currently, the diagnosis of early glaucoma is made by analyzing the presence of known risk factors in a patient, including elevated intraocular pressure (IOP), age, genetics, thin pachymetry readings, and vascular dysregulation. The more risk factors that are able to be evaluated, the faster and easier a diagnosis of glaucoma can be made. Early detection of glaucoma is critical to prevent and slow vision loss. The evidence revealed thus far suggests further research in this area is needed and may potentially lead to new treatment modalities in the future.

## References

- Wax M, Clark A, Civan MM. Mechanisms of Glaucoma. In: Yanoff M, Duker JS, eds. Ophthalmology. Philadelphia:Elsevier Inc.;2014:1012-8.
- Vohra R, Tsai JC, Kolko M. The Role of Inflammation in the Pathogenesis of Glaucoma. *Surv Ophthalmol* 2013;58:311-20.
- Deretzi G, Kountouras J, Grigoriadis N, Zavos C, Chatzigeorgiou S, Koutlas E, Tsiptsios I. From the "little brain" gastrointestinal infection to the "big brain" neuroinflammation: A proposed fast axonal transport pathway involved in multiple sclerosis. *Med Hypotheses* 2009;73:787-7.