

Overview

Approximately 4–12% of individuals with IBD will experience ocular manifestations associated with their condition (Sange). Ocular manifestations associated with IBD and ostomy can either be primary, secondary or coincidental. Primary manifestations are associated with inflammation from disease activity and typically resolve upon addressing underlying disease management (e.g. episcleritis, scleritis, uveitis and keratopathy). Secondary manifestations occur as a result of IBD disease activity itself and often include malabsorption issues (e.g. dry eyes) or medication side-effects (e.g. glaucoma and cataracts). Coincidental manifestations occur independently of IBD and ostomy (Mady). The most common ocular manifestations, both primary and secondary, associated with IBD and ostomy are outlined below:





- Episcleritis: The episclera is a thin layer of clear tissue covering the white part of the eye (sclera). Episcleritis, or inflammation of the episclera, can cause widening of blood vessels in the area leading to redness of the eye. In addition, episcleritis often presents with burning, irritation and pain. Episcleritis is the most common ocular manifestation associated with IBD (Mintz).
- Scleritis: Recurrent episodes of episcleritis can give rise to scleritis (inflammation of the white part of the eye called the sclera). Scleritis presents with severe eye pain and tenderness. Scleritis can damage important structures in the eye leading to vision impairment, so immediate care is critical (Malik).
- Uveitis: Inflammation of the middle layer of the eye, also called uveitis, can lead to redness, swelling, blurry vision and sensitivity to bright light. Because the uvea contains many blood vessels, inflammation in this area can damage important eye tissue leading to permanent vision impairment. The uvea includes the ciliary body (ring-shaped muscle that changes the shape of the eye to allow focus of an image), choroid (layer with blood vessels to provide nutrients and oxygen to the eye) and iris (pigmented aspect of eye).

• Keratopathy: Abnormality of the cornea (the clear, outer layer of the eye), also known as keratopathy, is a rare ocular manifestation of IBD more commonly associated with Crohn's disease. Keratopathy from IBD generally presents with either small, gray dots in the front aspect of the cornea or deeper tissue scarring of the cornea.



Keratoconjunctivitis sicca (KCS), more commonly known as dry eyes, is caused by vitamin A deficiency and can be common in individuals with IBD and ostomy.

Keratoconjunctivitis sicca (KCS) - dry eyes: vitamin A deficiency, which can be exacerbated by malabsorption associated with IBD and ostomies, can lead to KCS - more commonly known as dry eyes. Reduced tear production or increased evaporation of the watery film overlying the eye can cause dry eyes. In severe cases, dry eyes can contribute to reduction in nighttime vision or night blindness (Troncoso).

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Cataracts are caused by a clouding or thickness over the lens of the eye.

- Glaucoma: The eyes are connected to the brain via the optic nerve. In glaucoma, the optic nerve becomes damaged which can lead to patchy vision. As the condition advances, tunnel vision can occur or even total blindness. In individuals with IBD and/or ostomies, long-term corticosteroid use can increase pressure within the eye which can then damage the optic nerve - this process is known as secondary glaucoma.
- Cataract: A cataract is a clouding or thickness over the clear lens of the eye which most commonly presents as blurred vision. Long-term corticosteroid use is a risk factor for development of cataracts.

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Causes and Risk Factors in the General Population

- Age: Certain ocular conditions, specifically glaucoma and cataracts, are associated with increasing age. Risk of glaucoma increases significantly at age 60; however, the rate of glaucoma is significantly higher for African Americans with increased risk of glaucoma starting at just age 40 (American Optometric Association). After age 40, the risk of developing cataracts increases with each decade of life (National Eye Institute).
- Autoimmune conditions: Chronic inflammation associated with autoimmune conditions, such as lupus, scleroderma, rheumatoid arthritis, etc., have been associated with increased risk of inflammatory-based eye conditions (episcleritis, scleritis and uveitis).
- Diabetes: Diabetes, in particular, is associated with increased risk of cataract development and glaucoma. Long-term elevation of blood sugar levels can lead to structural changes in the eye which in turn increase risk of cataracts. These structural changes within the eye as associated with diabetes can also increase pressure in the eye leading to glaucoma.
- Damage to the eye: Whether through injury, infection or post-surgical eye complications, damage to the eye can cause inflammation leading to conditions such as episcleritis, scleritis and uveitis.
- Excessive sunlight exposure: Just as ultraviolet radiation from sunlight can be damaging to the skin, it can also lead to damage of the eyes. Too much unprotected sun exposure has been associated with development of cataracts.
- Genetics: Certain eye conditions, particularly keratopathy, cataracts and glaucoma, can have a genetic component. Having family members with particular eye conditions can increase your risk of developing that condition as well.
- Smoking: Toxins inhaled when smoking are taken up by the body and can be distributed in numerous locations including the eyes. These toxins can damage the eye tissue increasing risk of conditions such as uveitis, cataracts and glaucoma.



Causes and Risk Factors in IBD/Ostomy Patients

• Chronic inflammation: Inflammation due to disease activity is thought to contribute to inflammatory-based ocular conditions (e.g. episcleritis). While the mechanism behind this is still being further investigated, it is thought antibodies associated with IBD may also attack other components of the body as well leading to systemic inflammation.

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Causes and Risk Factors in IBD/Ostomy Patients (continued...)

- Corticosteroid use: Long-term corticosteroid use is known to elevate risk of glaucoma and cataracts. Corticosteroids can increase pressure in the eye leading to optic nerve damage and subsequent glaucoma. The mechanism behind cataract development and corticosteroid use is less well-known. It is thought that components of corticosteroids may bind to protein structures of the eye leading to their breakdown and contribution in cataract development.
- Malabsorption: Malabsorption of vitamin A due to IBD activity or an ostomy can lead to KCS better known as dry eyes.

Signs and Symptoms

Ocular manifestations associated with IBD and/or ostomies are generally denoted by pain/discomfort of the eye or impaired vision. If you notice any signs of ocular manifestations, it is crucial to reach out to a healthcare provider immediately as certain conditions (e.g. glaucoma and cataracts) may not show any signs prior to more advanced stages of the disease. Any signs of pain/discomfort of the eye or impaired vision should be followed up with a healthcare provider. Serious eye conditions can be prevented from progressing if intervention occurs early.



Diagnosis

Diagnosis of ocular manifestations typically begins with an eye examination. Depending upon your symptoms, the physician may do a physical examination of the eye or may utilize a penlight or slit-lamp examination. A penlight examination involves the physician shining a small penlight into the eye to observe factors such as pupil reaction, size, etc. A slit lamp examination requires the patient to sit in a chair as a light and microscope are directed onto the eye to allow a more thorough examination of the eye tissue. A visual acuity test will likely be performed as well in which the physician will have you read down a line of progressively smaller letters to evaluate for signs of vision impairment. Laboratory analysis may also be utilized in diagnosis of your eye condition. Samples of the tears or cellular tissue from the eye may help to narrow down a specific condition.

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Diagnosis (continued...)

Diagnosis of glaucoma is more involved than other ocular conditions associated with IBD and ostomies. In addition to the testing modalities detailed above, diagnosis of glaucoma also includes tonometry (a test that determines pressure within the eye), imaging tests (CT and ultrasonography), pachymetry (a test to determine corneal thickness), gonioscopy (a test to determine drainage of fluids in the eye) and visual field tests to assess for vision loss.

Treatment

Management of IBD disease activity is a key step in treating and preventing inflammatorybased eye conditions. Because chronic inflammation due to IBD can contribute to systemic inflammation and subsequent extraintestinal manifestations, management of underlying IBD activity is crucial.

In addition to underlying disease management, inflammatory eye conditions can be treated with corticosteroid eye drops, artificial tears, cold compresses around the eye and NSAIDs. Note that IBD patients should be conscientious when using oral NSAIDs as they can aggravate the intestinal lining and lead to exacerbation of IBD symptoms. In more serious cases with damage of the eye tissue, surgery may be required – particularly in cases of uncontrolled scleritis. There are numerous types of keratopathy which require different forms of treatment; however, for cases of keratopathy associated with IBD, the above treatment modalities are typically effective.

Treatment of dry eyes associated with IBD starts with increased vitamin A intake. By increasing vitamin A intake, one can hope to address the root cause of dry eyes. Additionally, artificial tears, punctal plugs (a device placed in the eye to prevent drainage of tears hence moistening the eye) and/or a humidifier may be of use in reducing symptoms.

Glaucoma treatment involves reducing pressure in the eye and hence preventing further damage to the eye. Dependent upon the situation, this can be done via prescription eye drops, oral medications, laser treatment and/or surgery. Unfortunately, damage caused by glaucoma cannot be reversed, so early diagnosis and prevention is key. With cataracts, the typical treatment involves removal of the lens and replacement with a clear artificial lens. This artificial lens then becomes a permanent aspect of the eye.

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There are several key aspects to preventing eye conditions for those with IBD and/or ostomy:



Prevention

The best way to prevent ocular complications associated with IBD and ostomy is disease management. By controlling underlying conditions, one can hope to minimize extraintestinal manifestations. Protective eyewear is also important for those with significant sun exposure or in environments where there is risk of eye injury. For those dealing with dry eyes due to vitamin A deficiency, increasing dietary vitamin A sources or utilizing supplementation may be helpful. Dietary vitamin A comes in two forms: retinol and beta-carotene. Retinol (which is really just vitamin A) is simply the direct form of vitamin A and is found in oily fish, eggs and dairy products. Beta-carotene is an indirect vitamin A source which is converted to retinol upon consumption. Beta-carotene sources include spinach, carrots, red peppers and mangos. If utilizing supplements to increase vitamin A intake, speak with your healthcare provider first as elevated levels can lead to vitamin A toxicity.

Further Resources

- Crohn's and Colitis Foundation: Eye Complications Fact Sheet (<u>https://www.crohnscolitisfoundation.org/sites/default/files/legacy/assets/pdfs/eyes.</u> <u>pdf</u>)
- Healthline Informational Article (https://www.healthline.com/health/crohnsdisease/crohns-disease-eyes)

Citations

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