



British and Éire Association of Medical Retina Specialists

Macular Oedema refers to the swelling or thickening of the macula, the central part of the retina responsible for sharp, detailed vision. The macula is crucial for tasks such as reading, recognizing faces, and seeing fine details. When fluid accumulates in the macula, it causes it to become swollen, which can lead to blurry or distorted central vision.

Causes of Macular Oedema

Macular oedema can be caused by several conditions, often related to damage or leakage from blood vessels in the retina. Some common causes include:

1. Diabetic Retinopathy:

- One of the most common causes of macular oedema is diabetic retinopathy, a complication of diabetes. High blood sugar levels can damage the small blood vessels in the retina, causing them to leak fluid into the macula, leading to swelling.

2. Age-Related Macular Degeneration (AMD):

- In wet AMD, abnormal blood vessels grow under the retina and leak fluid, causing macular oedema. This leads to rapid loss of central vision, particularly in older adults.

3. Retinal Vein Occlusion:

- A blockage in one of the veins that carry blood away from the retina (known as central retinal vein occlusion or branch retinal vein occlusion) can cause blood to back up, leading to fluid leakage and macular oedema.

4. Inflammatory Diseases:

- Conditions like uveitis (inflammation of the uveal tract) or other types of retinal inflammation can cause macular oedema due to fluid buildup.

5. Eye Surgery or Trauma:

- Following eye surgery (e.g., cataract surgery) or injury, inflammation can cause fluid to accumulate in the macula, leading to oedema.

6. Eye Infections:

- Some infections affecting the eye, such as herpes simplex virus or toxoplasmosis, can result in macular oedema as a result of inflammation.

7. Genetic Factors:

- Certain inherited conditions can predispose individuals to macular oedema.

Symptoms of Macular Oedema

The symptoms of macular oedema can vary depending on the severity of the swelling. Common symptoms include:

- Blurry or distorted central vision: The most noticeable symptom is often a decrease in sharp, clear vision in the centre of the field of view.
- Difficulty reading or seeing fine details: As the macula is responsible for detailed vision, macular oedema can make tasks like reading, recognizing faces, or seeing small objects more challenging.
- Colours appearing faded or washed out: People with macular oedema may notice that colours appear less vibrant.
- Straight lines appearing wavy: This is a phenomenon known as metamorphopsia, where straight lines look distorted, often due to swelling in the macula.
- Reduced contrast sensitivity: Difficulty distinguishing objects from their background, particularly in low-light conditions.

Diagnosis of Macular Oedema

To diagnose macular oedema, an eye care professional will perform a series of tests, which may include:

1. Comprehensive Eye Exam:

- The doctor will examine the retina using special instruments to look for signs of swelling or fluid accumulation in the macula.

2. Fluorescein Angiography:

- A dye is injected into the bloodstream, and a series of images of the retina are taken. This test helps to highlight any areas where blood vessels are leaking fluid or showing abnormal activity.

3. Optical Coherence Tomography (OCT):

- OCT is a non-invasive imaging technique that provides high-resolution cross-sectional images of the retina. It is particularly helpful in measuring the amount of fluid in the macula and assessing the degree of swelling.

4. Fundus Photography:

- Special cameras can take detailed photographs of the retina to track changes over time, which can be useful for diagnosing and monitoring macular oedema.

5. Visual Field Test:

- This test checks the full extent of a person's vision, helping to identify areas where vision may be impaired due to macular oedema.

Treatment for Macular Oedema

The treatment for macular oedema depends on its underlying cause, the severity of the condition, and the individual patient's needs. Some common treatment options include:

1. Anti-VEGF Injections:

- Anti-vascular endothelial growth factor (VEGF) therapy involves injecting medications like Lucentis (ranibizumab), Eylea (aflibercept), or Avastin (bevacizumab) into the eye. These medications block the action of VEGF, a protein that stimulates the growth of abnormal blood vessels in conditions like wet AMD and diabetic retinopathy. By reducing leakage from these vessels, anti-VEGF drugs can help reduce macular oedema.

2. Steroid Injections or Implants:

- Steroids, such as triamcinolone, can be injected into the eye to reduce inflammation and fluid buildup. Alternatively, a steroid implant like Ozurdex may be placed in the eye, which releases medication over time to reduce swelling.

3. Laser Therapy:

- Focal laser photocoagulation can be used to target specific areas of leaking blood vessels in the retina, helping to stop fluid leakage and reduce macular oedema. This method is often used in cases of diabetic macular oedema (DME).

4. Cataract Surgery:

- If macular oedema occurs after cataract surgery, the condition may resolve after surgery, though sometimes additional treatment, such as steroids or anti-VEGF therapy, may be required.

5. Diabetes Management:

- For patients with diabetic macular oedema (DME), controlling blood sugar levels is essential in preventing further fluid buildup and slowing the progression of the disease. Keeping blood pressure and cholesterol under control is also important in managing DME.

6. Treatment of Underlying Conditions:

- If macular oedema is caused by an inflammatory condition (e.g., uveitis), treating the underlying inflammation with corticosteroids or other immunosuppressive medications can help reduce the swelling in the macula.

Preventing Macular Oedema

While some risk factors, such as genetic predisposition, cannot be controlled, the following steps can help prevent or reduce the risk of macular oedema:

- Control blood sugar levels: For individuals with diabetes, keeping blood glucose levels within the target range can help prevent diabetic retinopathy and diabetic macular oedema.
- Regular eye exams: For people at risk, including those with diabetes or age-related macular degeneration, regular eye exams with dilation can help detect macular oedema early.
- Manage high blood pressure and cholesterol: Proper management of blood pressure and cholesterol can reduce the risk of macular oedema in conditions like diabetic retinopathy and retinal vein occlusion.
- Quit smoking: Smoking is a known risk factor for age-related macular degeneration and other retinal diseases, so quitting smoking can help preserve eye health.
- Wear sunglasses: Protecting your eyes from excessive UV light exposure may help prevent some eye conditions, including macular oedema.

Prognosis

The prognosis for macular oedema depends on the underlying cause, the severity of the swelling, and how quickly treatment is initiated. In some cases, vision can be significantly improved or stabilized with treatment, especially if macular oedema is detected early. However, if left untreated, macular oedema can lead to permanent vision loss in the affected eye.

For people with diabetic macular oedema (DME), effective management of diabetes and regular eye monitoring can help slow the progression of the condition and preserve vision.

Conclusion

Macular oedema is a serious condition that can lead to significant vision impairment if not managed appropriately. Early diagnosis and treatment are essential to prevent permanent damage to the macula and to preserve central vision. Regular eye exams, especially for those at risk (such as people with diabetes or AMD), can help catch macular oedema early, allowing for more effective treatment.