Review Article

Pediatric uveitis

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Abstract

Up to 10% of uveitis cases occur in children, with notable implications due to the risk of chronicity and vision loss. It can result from infections, autoimmune and autoinflammatory diseases, trauma, or masquerade syndromes. Primary care providers are vital in early detection, symptom management, and timely specialist referral. Depending on the etiology, symptoms may include redness, pain, photophobia, vision changes, and sometimes more severe vision loss or intense pain. Conservative initial treatment may include pain relievers and corticosteroid eye drops. Specialist care involves a thorough ocular examination and diagnostic tests to identify the underlying cause. Treatment aims to control inflammation and preserve vision, often necessitating long-term medication, with compliance being crucial. In low-resource settings, telemedicine and generic drugs may be useful to manage costs. Preventative strategies focus on prenatal care to avoid congenital infections, and distinguishing uveitis from conditions like conjunctivitis is essential for proper treatment. Multidisciplinary care ensures comprehensive management of the child's health. In summary, early intervention and a collaborative approach among healthcare providers are key to mitigating the impact of uveitis on a child's life.

Keywords: Family medicine, juvenile idiopathic arthritis, ocular toxoplasmosis, ophthalmology

Introduction

Uveitis is a diverse group of inflammatory diseases. Although only the iris, ciliary body, and choroid are part of the uveal tract of the eye, inflammatory conditions affecting adjacent ocular tissues, including the retina, optic nerve, and vitreous humor, are also referred to as uveitis.[1]

Uveitis is uncommon in children, representing 5–10% of uveitis cases. While figures vary between regions, the incidence of uveitis in youngsters in high-income countries is approximately 4.3 in 100,000, with a prevalence of 27.9 in 100,000.[2]

Uveitis can arise from trauma and non-infectious processes, including autoimmune disorders, or can be secondary to pathogens such as bacteria, viruses, fungi, and parasites. Rarely, masquerade syndromes, such as primary tumors of the eye or intraocular metastasis, mimic uveitis.[1]

Clinically, uveitis is classified based on the primary location of the inflammation, as follows: Anterior (iris and ciliary body), intermediate (vitreous), posterior (retina and choroid), and panuveitis (diffuse intraocular inflammation). Diagnostic assessment of uveitis involves a comprehensive ophthalmic examination coupled with laboratory and imaging studies to identify the underlying etiology and to determine the extent of intraocular involvement.[1]

Causes of Uveitis in Children

Infectious causes

These include conditions like tuberculosis, toxoplasmosis [Figure 1], herpes, bartonellosis, and toxocariasis.[2]

Autoimmune diseases

Juvenile idiopathic arthritis (JIA) is the most common systemic disorder associated with pediatric uveitis.[3] Other systemic

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illnesses, such as sarcoidosis and Vogt-Koyanagi-Harada syndrome, can also lead to uveitis.

Trauma

Eye injuries can cause uveitis. The possibility of physical abuse should be considered.

Undifferentiated

It means that a specific cause could not be identified. Over time and with regular follow-up, additional features may manifest, suggesting an underlying cause.

Identification at the Primary Level of Care

What to look for at the primary care level, and when to refer

Every child with uveitis is overseen by an eye care specialist, given the potential complexities of this condition. However, primary healthcare providers are often the first to suspect the onset or recurrence of uveitis, which can be crucial for early intervention to limit complications. Primary care providers also have an important role in reinforcing treatment compliance. Training, use of portable cameras, and remote consultations with specialists can be invaluable tools to bridge the gap, ensuring children receive timely care even in settings experiencing a shortage of ophthalmologists.

It is essential to be aware of symptoms that might indicate uveitis in children. These include ocular redness, photophobia, blurred vision, dark floating spots, ocular pain, and pupil irregularities. Vision complaints may vary from complete absence to profound vision loss. In unilateral cases, with good visual acuity in the fellow eye, some children might have difficulty identifying decreased vision. Chronically, vision can be impaired due to cataracts, glaucoma, retinal detachment, macular edema, and band keratopathy (deposition of calcium on the cornea), among other complications[4] [Figure 2].

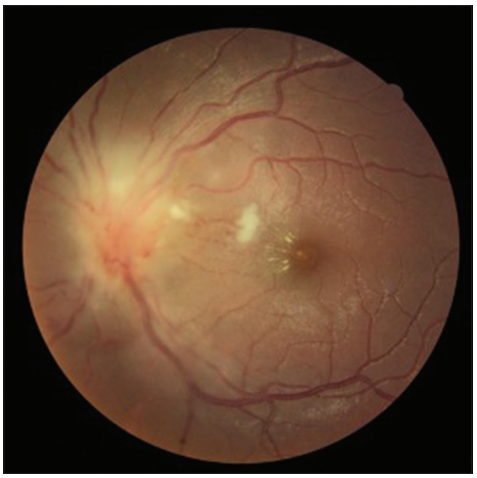

Figure 1: Fundus photography of the left eye in an adolescent, revealing characteristic features of ocular toxoplasmosis. Notable findings include a toxoplasmic lesion located at the upper nasal border of the optic disc, surrounded by retinal inflammation and associated with retinal vasculopathy, indicative of active disease

Initial treatment options

At the primary care level, the initial treatment approach should be conservative, primarily focused on relieving immediate symptoms. Over-the-counter pain relievers like acetaminophen or ibuprofen can be helpful for pain control. Eye drops containing corticosteroids can be prescribed to reduce inflammation and provide relief from pain and redness.

When to refer

Every case of uveitis should be seen by an eye care specialist or managed by a primary care practitioner with remote support by the specialist. In cases where there is either sudden or profound vision loss or intense pain, immediate referral is essential. When referring, the primary care provider should provide a detailed account of the duration of symptoms, all observations, and any treatments. This ensures that the specialist has a clear picture of the progression of the condition and can take over the management efficiently.

Diagnosis and Management at the Tertiary Level

Diagnostic procedures

A thorough examination of the child is imperative. Both eyes should be checked, both before and after the pupil has been dilated, to ensure no detail is overlooked. Other systemic signs should be noted, including skin or joint manifestations. Blood samples should be taken for investigations to rule out or confirm primary infectious causes for the uveitis.

Various imaging modalities like fundus fluorescein angiography, optical coherence tomography, and fundus autofluorescence can provide detailed insights into the eye's condition. In situations where the eye's media is opaque, an ultrasound might be more

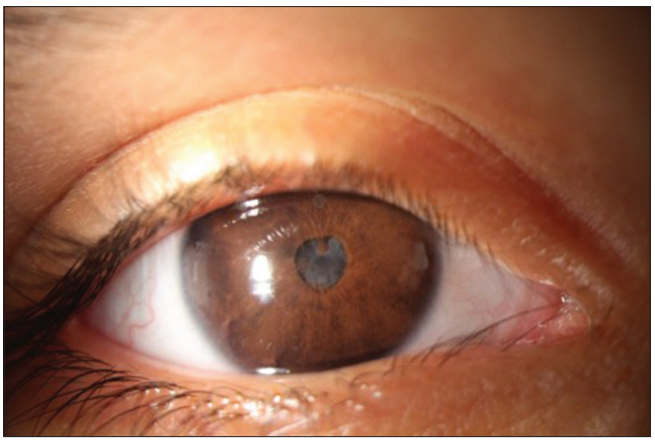

Figure 2: Slit lamp examination (right eye) of a child displaying uveitis sequelae. Notable features include irregular pupil shape due to posterior synechiae, cataract, and band keratopathy

revealing. When systemic diseases are suspected, imaging tests such as X-rays might be necessary.

Treatment options

Treatment strategies aim to control inflammation, prevent complications, and preserve visual function. Chronic medication use is often necessary, and it is essential to emphasize the importance of compliance to the patients and their caregivers. While corticosteroid-sparing drugs can be effective, they might take time to have effects.[5] Anterior uveitis typically requires topical treatments (eye drops).[5] However, for intermediate, posterior, and panuveitis, systemic medications are often prescribed. Even if the uveitis results from an infection, which demands treatment targeting the pathogen, anti-inflammatory medications might still be necessary. Surgical interventions may be indicated to deal with complications, such as glaucoma, cataracts,[6] and retinal detachment.[4] Regular follow-up is critical to track the progression of the disease, the effectiveness of treatments, and to detect any potential complications early.

Options for low-resource settings

Portable cameras, telemedicine, and artificial intelligence can help primary care providers detect uveitis and initiate appropriate treatment promptly. Generic medications can be considered to reduce treatment-associated costs. There is a wide variation in the prices of corticosteroid-sparring agents, and protocols need to consider costs when recommending the first line of treatment in low-resource settings.

Tips

Prevention strategies

Prevention of congenital infectious uveitis, caused by syphilis and toxoplasmosis, for example, is paramount.[7] It is vital that expecting mothers receive proper prenatal care to minimize the risk of transmitting an infection to the fetus.

Uveitis versus conjunctivitis

Uveitis displays more pronounced conjunctival redness near the cornea, while conjunctivitis affects the conjunctiva more diffusely. Uveitis usually lacks discharge but can cause tearing, whereas conjunctivitis rarely results in photophobia and pain.

Early detection and support

Prompt detection is vital to avoid amblyopia. Regular eye examinations, particularly for children with predisposing conditions, and treatment monitoring are essential. Caregivers are crucial in ensuring treatment adherence, understanding medication side effects, and seeking medical consultation whenever needed.

Multidisciplinary care

Uveitis in children might link to other medical issues. Collaborative care involving various specialists ensures a holistic approach.

Rehabilitation

For children with irreversible vision loss, rehabilitation,[8] including adaptive skills training, assistive technologies, and psychological support, ensure a fulfilling life.

Conclusion

Uveitis poses distinct challenges in children and can lead to permanent vision loss and reduced quality of life.[9] The risk of amblyopia is a key concern. Treatments for uveitis, like systemic corticosteroids, can lead to multiple side effects[5] [Figure 3]. Impaired visual acuity can hinder academic performance and reduce economic reach. The long-term implications can be substantial, with potential decades of disability due to vision issues, recurrent inflammations, and surgeries. In conclusion, pediatric uveitis is not just "uveitis in a smaller eye." There are unique considerations for diagnosis, treatment, and management. A multidisciplinary approach[10] involving general practitioners, ophthalmologists, pediatricians, rheumatologists, and other specialists is often required to ensure optimal care. Primary care providers have a key role in detecting suspected cases and recurrences, addressing potential complications, and reinforcing the importance of adhering to medication.

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Conflicts of interest

There are no conflicts of interest.

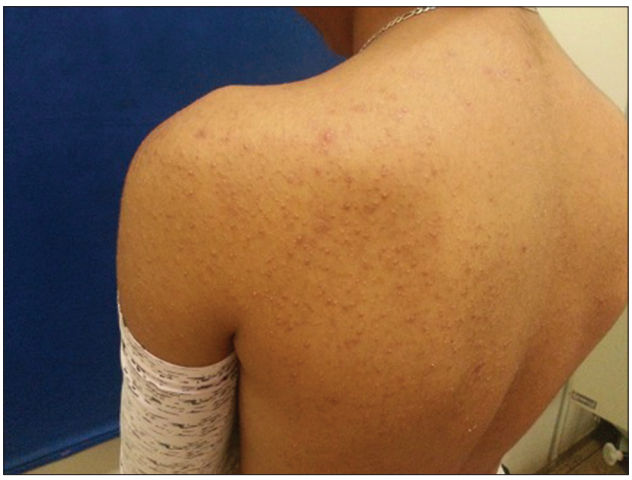

Figure 3: Acneiform eruptions in a child due to chronic use of oral steroids for intermediate uveitis. The regions of the upper back and shoulder are prominently displayed

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