



Pediatric Uveitis: Clinical Features, Diagnostic Challenges, and Long-Term Management Strategies

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DESCRIPTION

Pediatric uveitis is a relatively rare yet potentially sight-threatening inflammatory condition that presents unique diagnostic and therapeutic challenges. Unlike adults, children often exhibit uveitis as a silent and insidious disease, with minimal symptoms until significant ocular damage has occurred. This delay in diagnosis can lead to complications such as cataract formation, glaucoma, band keratopathy, and macular edema, all of which may contribute to irreversible visual loss. Understanding the clinical features, systemic associations, and long-term management strategies of pediatric uveitis is essential for effective care and optimal visual outcomes.

The incidence of pediatric uveitis varies globally, accounting for approximately 5%-10% of all uveitis cases. It can be categorized anatomically into anterior, intermediate, posterior, and panuveitis, with anterior uveitis being the most common subtype. The etiology can be infectious, non-infectious, or idiopathic. Among non-infectious causes, Juvenile Idiopathic Arthritis (JIA)-associated uveitis is the most frequent and presents predominantly as chronic anterior uveitis. These children are typically asymptomatic, making regular screening essential, particularly in ANA-positive, oligoarticular JIA patients under the age of seven.

Infectious etiologies, including toxoplasmosis, herpes simplex virus, cytomegalovirus, and tuberculosis, tend to present more acutely and may be associated with systemic symptoms. Posterior uveitis in children is often linked to infections and can lead to chorioretinal scarring if not promptly treated. In addition, systemic inflammatory diseases such as sarcoidosis, Behçet's disease, Vogt-Koyanagi-Harada syndrome, and inflammatory bowel disease may manifest with uveitis and must be considered during the diagnostic workup. A comprehensive history, systemic examination, and targeted laboratory investigations are critical to identify underlying systemic conditions.

The diagnosis of pediatric uveitis is complicated by children's limited ability to communicate symptoms such as floaters, photophobia, or vision loss. Often, signs like redness or tearing may be the only visible indicators. Slit-lamp examination, intraocular pressure measurement, and dilated fundus examination are

necessary for an accurate assessment. Ancillary tests such as OCT, fluorescein angiography, and ultrasonography B-scan are valuable in evaluating the extent of intraocular inflammation and associated complications. Laboratory investigations are guided by clinical suspicion and may include ANA, HLA-B27, ACE, PPD, and serologies for infectious agents.

Treatment strategies for pediatric uveitis aim to control inflammation, preserve vision, and prevent complications while minimizing drug-related side effects. Topical corticosteroids remain the first-line therapy for anterior uveitis but require careful monitoring due to risks of ocular hypertension and cataract formation. Cycloplegic agents help prevent posterior synechiae and alleviate ciliary spasm. Systemic corticosteroids are indicated in moderate to severe disease or when posterior segment involvement is present. However, due to the adverse effects of prolonged steroid use, early introduction of steroid-sparing immunosuppressive therapy is often warranted.

Methotrexate is the most widely used immunomodulatory agent in pediatric uveitis and has shown efficacy in achieving remission in JIA-associated and idiopathic cases. Mycophenolate mofetil, azathioprine, and cyclosporine are other agents used depending on disease severity and patient tolerance. Biologic therapies targeting TNF- α , such as adalimumab and infliximab, have revolutionized the management of refractory cases and are increasingly used as first-line agents in specific settings. The recent approval of adalimumab for non-infectious uveitis in children marks a milestone in pediatric ophthalmic care.

Monitoring the response to therapy and managing complications are integral to long-term care. Regular ophthalmologic evaluations, including visual acuity testing and imaging, are essential. Intraocular pressure must be closely observed to detect steroid-induced glaucoma. Cataract surgery in children with uveitis requires careful preoperative control of inflammation and postoperative immunosuppression to prevent recurrence. Similarly, macular edema may require adjunctive treatments such as intravitreal steroids or anti-VEGF agents, though their use in children must be carefully weighed against potential risks.

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