OPEN ACCESS Freely available online

Journal of Hepatology and Gastrointestinal disorders

Perspective

Pediatric Autoimmune Hepatitis: Diagnosis, Management and Future Directions

Rebecca L. Simmons*

Division of Pediatric Hepatology, Children's Hospital of Philadelphia, University of Pennsylvania, Philadelphia, PA, USA

DESCRIPTION

Pediatric AutoImmune Hepatitis (AIH) is a chronic, immune-mediated liver disease characterized by hepatocellular inflammation, elevated immunoglobulin G (IgG) and circulating autoantibodies. Although relatively rare, AIH in children presents a unique clinical challenge due to its variable presentation, potential for rapid progression and lifelong implications. Despite significant advances in understanding AIH pathogenesis and treatment, many uncertainties remain particularly around early diagnosis, optimal long-term management, and the prevention of relapse. As pediatric hepatology evolves, a re-examination of how we diagnose and manage AIH is warranted, especially in high-resource settings where novel diagnostics and personalized therapies are within reach.

AIH in children can mimic numerous other liver disorders, ranging from viral hepatitis to Wilson's disease and NonAlcoholic SteatoHepatitis (NASH). Its presentation can vary from asymptomatic transaminase elevation to fulminant hepatic failure. Classic serologic markers AntiNuclear Antibodies (ANA), Anti-Smooth Muscle Antibodies (ASMA) and anti-liver kidney microsomal type 1 (anti-LKM1) antibodies remain central to diagnosis, alongside elevated IgG and histologic confirmation *via* liver biopsy. However, up to 20% of pediatric cases may lack characteristic serologic profiles, contributing to diagnostic delay. In this context, pediatric-specific diagnostic criteria are being re-evaluated to improve sensitivity without compromising specificity. Liver histology remains a cornerstone of diagnosis. The hallmark features—interface hepatitis, lymphoplasmacytic infiltration and lobular inflammation—help distinguish AIH from other pediatric liver conditions. However, interpretation in children requires experience and nuance, as overlap syndromes with sclerosing cholangitis or primary biliary cholangitis may be present. In high-income countries, access to experienced pediatric hepatopathologists and ancillary immunohistochemical tools can significantly enhance diagnostic accuracy.

Once diagnosed, early and aggressive immunosuppression is critical to prevent progression to cirrhosis. The standard first-line therapy includes corticosteroids, often in combination with azathioprine. Most children respond well to this regimen, achieving biochemical remission within weeks. However, the long-term use of corticosteroids is not without consequence particularly in pediatric populations where growth, bone health and metabolic stability are paramount. Therefore, steroid-sparing protocols and alternative immunosuppressants such as mycophenolate mofetil are increasingly being explored. Adherence to therapy remains a significant concern, especially during adolescence. Relapse is common after premature withdrawal or non-adherence, highlighting the need for patient education, psychosocial support and transition programs to adult care. High-income countries are beginning to develop structured transition clinics, which bridge pediatric and adult hepatology and have shown promise in improving long-term adherence and outcomes.

A pressing issue in AIH management is the lack of reliable biomarkers to predict relapse or guide therapy withdrawal. Current strategies rely heavily on serum transaminases and IgG levels, both of which may lag behind disease activity or show nonspecific changes. In the future, noninvasive markers of immune activation, such as cytokine profiles, circulating T-cell subsets, or liver-specific microRNAs, may allow for better risk stratification and personalization of therapy. This is particularly relevant in resource-rich settings, where access to advanced laboratory platforms makes such innovations feasible. In parallel, efforts are underway to better understand the immunogenetics of pediatric AIH. HLA typing, gene expression studies and single-cell immune profiling have begun to unravel the molecular heterogeneity of AIH. Insights from these studies may pave the way for targeted biologic therapies—such as B-cell depletion or checkpoint modulation which are already being tested in refractory adult autoimmune diseases.

The role of the gut–liver axis in autoimmune liver disease is also gaining attention. Emerging research suggests that dysbiosis and impaired mucosal immunity may contribute to the loss of immune tolerance in AIH. Trials of probiotics, dietary interventions, or microbiota-directed therapies may become an adjunct to immunosuppression in the near future. Despite these

Correspondence to: Rebecca L. Simmons, Division of Pediatric Hepatology, Children's Hospital of Philadelphia, University of Pennsylvania, Philadelphia, PA, USA, E-mail: rebeccasimons@chop.edu

Received: 02-Mar -2025, Manuscript No. JHGD-25-38260; **Editor assigned:** 04-Mar-2025, PreQC No. JHGD-25-38260 (PQ); **Reviewed:** 18-Mar-2025, QC No. JHGD-25-38260; **Revised:** 25-Mar-2025, Manuscript No. JHGD-25-38260 (R); **Published:** 03-Apr-2025, DOI: 10.35248/2475-3181.25.11.351.

Citation: Simmons RL (2025). Pediatric Autoimmune Hepatitis: Diagnosis, Management and Future Directions. J Hepatol Gastroint Dis.11:351.

advances, major gaps remain in clinical practice. There are no universally accepted pediatric-specific guidelines for diagnosis and management. Most recommendations are extrapolated from adult studies, often failing to consider the unique developmental, psychosocial and immunologic aspects of pediatric patients. Collaborative consortia and multicenter pediatric liver networks many of which are thriving in high-income regions are essential for generating robust, age-specific data.

CONCLUSION

Pediatric autoimmune hepatitis remains a complex but increasingly manageable disease. Advances in diagnostics, immunosuppressive regimens and emerging biomarkers are transforming the way we understand and treat AIH in children. In high-income countries, the infrastructure exists to take this evolution further by embracing personalized medicine, fostering collaborative research and prioritizing long-term patient support. Looking ahead, the challenge will be to harmonize clinical care with scientific discovery. By bridging gaps between bench and bedside, we can offer children with AIH not just disease control, but the possibility of a full and healthy life.