

Early biomarkers for autism spectrum disorder: A systematic review of diagnostic advances in early childhood

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Autism Spectrum Disorder (ASD) is a complex neurological condition in humans that is usually detected in early childhood. This disorder affects a child's ability to communicate, interact and behave well socially. As in the name, "spectrum", the symptoms and disabilities of this disease can vary from mild to severe. It is observed in 1–2% of the global population, in which boys are more commonly affected. Early diagnosis is crucial but challenging due to symptom variability. The main objective of this research is to systematically review and arrange evidence on early biomarkers of ASD with an aim to find potential tools for early diagnosis in infants and children aged 0–5 years. This research was put together following the PRISMA guidelines and data was extracted from articles published in the last 10 years. Data was grouped into domains: genetic/epigenetic, neuroimaging, EEG/ERP, biochemical, and behavioral. Early signs can be found through changes in genes like CHD1 and LAMP1. Brain scans show unusual growth and connections, and AI improves early predictions. EEG shows slower brain responses to sounds and faces. Blood, saliva, and stool tests reveal inflammation, vitamin imbalances, and gut issues. Behavioral tools like eye-tracking and M-CHAT help identify ASD early. Early detection improves therapy outcomes. Combining biomarkers enhances accuracy. More research is needed to reduce costs and false positives. It is sure that biomarker-based diagnosis can reduce the load on families and the healthcare systems to a great extent in the long term.

Biography

Romila Peter is a second-year medical student studying in Georgia, with a deep passion for medicine, mental health, and sports. She is the co-founder of UNCLOUDED, a student-led mental wellness initiative that creates safe spaces and support systems for young minds. Romila has completed several observerships, participated in international research projects, and aspires to become a sports medicine physician. Guided by purpose and empathy, she hopes to create lasting impact in both healthcare and the lives she touches.

Received: 16 September, 2025; **Accepted:** 19 September, 2025; **Published:** November 28, 2025
