Neurodiversity in type 2 diabetes isn't evenly spread by age

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Early-onset type 2 diabetes is rising, and it is already known to carry a higher complication burden and lower rates of hitting treatment targets than diabetes diagnosed later in life. A new cross-sectional analysis presented at the EASD Annual Meeting in Milan adds a specific, previously under-quantified barrier to that picture: neurodiversity, which turns out to be dramatically more common in people diagnosed with type 2 diabetes at a young age.

KEY TAKEAWAYS

- The Pivot: Neurodiversity in type 2 diabetes is not evenly spread by age, it is concentrated overwhelmingly in the youngest patients.
- The Data: Autism prevalence was 2.3% with type 2 diabetes versus 0.6% without at age 20-29 (RR 4.0); ADHD was 14.4% versus 6.7% under age 20 (RR 2.1).
- The Action: Services for early-onset type 2 diabetes should plan for a materially higher rate of autism and ADHD among younger patients, not treat it as an occasional comorbidity.

Researchers used the TriNetX US collaborative network, which pools harmonised electronic medical records across numerous healthcare organisations. They identified individuals with newly diagnosed type 2 diabetes and grouped them by age at diagnosis into ten-year bands, then 1:1 propensity-score matched each band to people without type 2 diabetes, controlling for age at identification, year of birth, sex, ethnicity and race. From 4.2 million individuals with type 2 diabetes and 17.1 million without, 3.4 million matched pairs aged under 80 were included.

The steepest gap sits in the youngest patients

In both groups, neurodiversity prevalence was highest at younger ages and declined quickly with age, becoming extremely low beyond age 40. But the gap between people with and without type 2 diabetes was not constant across ages, it was concentrated almost entirely in the young.

For autism, the relative risk (RR) comparing people with versus without type 2 diabetes was highest at age 20-29: RR 4.0 (95% CI 3.6-4.5), corresponding to a prevalence of 2.3% with type 2 diabetes against 0.6% without. For ADHD, the pattern was similar but peaked even earlier, at age under 20: RR 2.1 (95% CI 2.0-2.2), or 14.4% with type 2 diabetes against 6.7% without. A comparable decline in relative risk with increasing age was seen for dyslexia, while the relative risks for dyspraxia and dyscalculia were more variable across age bands.

Why this matters for early-onset care

Early-onset type 2 diabetes already faces documented barriers to care: stigma, adverse psychosocial wellbeing, and the competing demands of early adulthood. This analysis suggests a substantial share of that population is also managing autism or ADHD, conditions that shape how someone processes appointment scheduling, dietary instructions and long-term self-monitoring, on top of the diabetes itself.
The authors conclude that individuals diagnosed with type 2 diabetes earlier in life have a disproportionately increased prevalence of neurodiversity compared with those diagnosed later, most pronounced under age 20, and that neurodiversity itself may be associated with a heightened risk of early-onset disease in the first place. No funding or industry conflicts were declared for this analysis.

The convergence of neurodiversity and early-onset type 2 diabetes necessitates a re-evaluation of current clinical pathways. For individuals with autism, challenges in social communication and executive function can complicate adherence to complex treatment regimens, including medication schedules, blood glucose monitoring, and dietary modifications. Similarly, ADHD, characterized by inattention, impulsivity, and hyperactivity, can impair consistent self-management and engagement with healthcare providers. These neurodevelopmental differences are not merely comorbidities; they fundamentally alter the patient's interaction with the healthcare system and their capacity for self-care, demanding a more tailored and empathetic approach from clinicians. Understanding these underlying neurocognitive profiles can help healthcare professionals anticipate potential barriers and implement strategies to improve engagement and outcomes.

For instance, traditional patient education methods, often reliant on verbal instructions and written materials, may be less effective for neurodivergent individuals. Instead, visual aids, simplified language, and structured, predictable appointment routines could significantly enhance understanding and compliance. The authors' finding that neurodiversity itself may be associated with a heightened risk of early-onset disease suggests a potential underlying biological or behavioral link that warrants further investigation. This could involve shared genetic predispositions, inflammatory pathways, or lifestyle factors influenced by neurodevelopmental traits. Unpacking these connections could lead to novel screening strategies or preventative interventions for at-risk populations.

Clinical Implications for Screening and Management

The disproportionately increased prevalence of neurodiversity in individuals diagnosed with type 2 diabetes earlier in life mandates a proactive approach to screening and management within this specific demographic. Clinicians should consider incorporating routine, brief screening tools for autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) in young adults and adolescents presenting with new-onset type 2 diabetes. While formal diagnostic assessments are typically conducted by specialists, an initial screen can flag individuals who may benefit from further evaluation and, crucially, prompt immediate adjustments to their diabetes care plan to accommodate potential neurodevelopmental differences. This is particularly vital given the established barriers to care already faced by this younger cohort, where the added layer of neurodiversity can exacerbate existing challenges.

Tailoring management strategies for neurodivergent patients with type 2 diabetes involves several key considerations. Communication should be clear, concise, and concrete, avoiding jargon and abstract concepts. Providing information in multiple formats—visual schedules, written summaries, and verbal instructions—can enhance comprehension. For patients with ADHD, strategies to improve adherence might include setting reminders, simplifying medication regimens, and breaking down complex tasks into smaller, manageable steps. For those with ASD, establishing predictable routines, minimizing sensory overload in clinic environments, and using direct, unambiguous language can foster a more effective therapeutic relationship. Furthermore, involving caregivers or support systems, where appropriate and with patient consent, can provide an additional layer of support for self-management.

The study, while robust in its use of a large, real-world dataset, does have limitations inherent to retrospective analyses of electronic medical records. The identification of neurodiversity relies on diagnostic codes, which may not capture all individuals with undiagnosed conditions, potentially underestimating true prevalence. Furthermore, the study design establishes an association rather than causation, meaning it cannot definitively conclude whether neurodiversity directly increases the risk of early-onset type 2 diabetes or if shared underlying factors contribute to both. Future prospective studies employing standardized diagnostic criteria for neurodevelopmental conditions and longitudinal follow-up would be invaluable to elucidate the causal pathways and refine risk stratification models. Nevertheless, the immediate clinical implication remains: neurodiversity is a significant factor in early-onset type 2 diabetes that demands specific attention in clinical practice.

Ultimately, recognizing and addressing neurodiversity in young patients with type 2 diabetes is not just about improving diabetes outcomes; it is about providing person-centered care that respects individual differences and optimizes overall well-being. By adapting our clinical approaches, we can mitigate the unique challenges faced by this vulnerable population, potentially reducing the burden of disease and improving their long-term health trajectories. This study serves as a critical reminder that a one-size-fits-all approach to diabetes management is insufficient, particularly in the context of complex patient populations.

> **CLINICAL IMPLICATIONS**
> For clinics managing early-onset type 2 diabetes, this data is a case for screening or at least actively asking about neurodiversity in younger patients rather than assuming standard diabetes education and appointment structures will work equally well across the caseload. A patient under 20 with type 2 diabetes has, on this data, more than double the ADHD prevalence of an age-matched peer without diabetes.
> The analysis is cross-sectional and drawn from US electronic health records, so it shows association and prevalence, not causation, and captures only neurodiversity that has been formally coded in the record, which may under-count undiagnosed cases in either group. The authors themselves frame the relationship as potentially bidirectional, existing neurodiversity may raise the risk of early-onset type 2 diabetes, rather than diabetes causing neurodiversity.

> Either way, the practical implication for services is the same: barriers to care in early-onset type 2 diabetes are unlikely to be resolved by generic adherence interventions if a substantial share of the youngest patients are also navigating undiagnosed or unsupported autism or ADHD.

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