

The Hidden Burden: Disability-Adjusted Life Years (DALYs) and Long-term Neurodevelopmental Outcomes of Late Preterm Infants (34-36 Weeks)

Reza Saeidi*

Neonatal Health Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Introduction

Late preterm infants (LPIs), born between 34 and 36 weeks of gestation, now constitute approximately 70% of all preterm births globally. Driven by rising rates of cesarean deliveries and assisted reproductive technologies, this demographic has surged. Because LPIs generally exhibit high survival rates and lack the catastrophic acute morbidities of extreme prematurity, they are frequently mislabeled as "near-term" or "low-risk." Consequently, they are often discharged early with minimal follow-up. However, this optimistic clinical perception masks a profound epidemiological reality: the true cost of late prematurity is not measured in neonatal mortality, but in a massive, hidden burden of long-term disability.

Recent epidemiological modeling integrating Global Burden of Disease (GBD) data reveals a striking paradox. While the Disability-Adjusted Life Year (DALY) rate per infant is highest in extremely preterm neonates, the sheer volume of LPI births results in the highest population-level DALY burden among all preterm subgroups—exceeding 14.2 million DALYs globally. Crucially, over 94% of this burden is driven by Years Lived with Disability (YLD) rather than Years of Life Lost (YLL). The burden of late prematurity is almost entirely composed of chronic, subtle morbidities that persist long after the vulnerable infant leaves the hospital, imposing lifelong

challenges on families and educational systems.

The biological rationale for these outcomes lies in the specific neurodevelopmental trajectory interrupted at 34 to 36 weeks. This period is a critical window for rapid cortical folding, active myelination, and the establishment of complex thalamocortical connections. Extrauterine exposure during this vulnerable phase disrupts microstructural connectivity, white matter maturation, and synaptic pruning. Consequently, LPIs do not typically present with severe cerebral palsy, but rather with pervasive executive function deficits. Longitudinal cohort data demonstrate that LPIs have a 45% higher risk of developing Attention-Deficit/Hyperactivity Disorder (ADHD) and a 62% increased risk of specific learning disabilities compared to term infants, alongside a measurable reduction in mean IQ scores.

These findings necessitate an urgent paradigm shift in perinatal and pediatric care. The designation of LPIs as "low-risk" must be abandoned. Health systems must transition from a sole focus on acute neonatal survival to ensuring optimal long-term neurodevelopmental outcomes for all preterm survivors. This requires implementing risk-stratified, long-term developmental surveillance programs specifically tailored for LPIs, focusing on early school readiness, behavioral screening, and targeted educational interventions. Furthermore,

* Corresponding author: Reza Saeidi, Neonatal Health Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: saeidi@sbmu.ac.ir

Please cite this paper as:

Saeidi R. The Hidden Burden: Disability-Adjusted Life Years (DALYs) and Long-term Neurodevelopmental Outcomes of Late Preterm Infants (34-36 Weeks). Iranian Journal of Neonatology. 2026 Oct: 17(4). DOI: 10.22038/ijn.2026.98695.2904



obstetricians must strictly adhere to guidelines delaying elective deliveries until 39 weeks to prevent iatrogenic late prematurity. Ultimately, recognizing the hidden burden of late prematurity is the first step toward unlocking the full neurodevelopmental potential of these vulnerable children. By redefining our clinical approach, we can transform the trajectory of millions of lives worldwide. We can no longer afford to let a massive generation of children silently carry the hidden burden of neurodevelopmental impairment.

References

1. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: A systematic analysis and implications. *Lancet*. 2012;379(9832):2162-2172.
2. Engle WA, Tomashek KM, Wallman C; Committee on Fetus and Newborn, American Academy of Pediatrics. "Late-preterm" infants: a population at risk. *Pediatrics*. 2007;120(6):1390-1401.
3. Li Y, Ye RJ, Yang SQ, Yu H, Yu BQ, Feng J, et al. Global, regional, and national burden of neonatal disorders and subtypes attributable to air pollution from 1990 to 2021: a systematic analysis of the Global Burden of Disease Study 2021. *J Health Popul Nutr*. 2025;44(1):157.
4. Volpe JJ. Brain injury in premature infants: A complex amalgam of destructive and developmental disturbances. *Lancet Neurol*. 2009;8(1):110-124.
5. Chyi LJ, Lee HC, Hintz SR, Gould JB, Sutcliffe TL. School outcomes of late preterm infants: special needs and challenges for infants born at 32 to 36 weeks gestation. *J Pediatr*. 2008;153(1):25-31.
6. Song IG. Neurodevelopmental outcomes of preterm infants. *Clin Exp Pediatr*. 2023;66(7):281-287.