LETTER TO THE EDITOR

Placental stem cell therapy: a promising avenue for bronchopulmonary dysplasia in preterm infants

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Bronchopulmonary dysplasia (BPD) remains a major complication in premature infants with respiratory distress syndrome (RDS), particularly those requiring prolonged high-flow oxygen and invasive mechanical ventilation. Damage to underdeveloped lungs during neonatal care results in long-term respiratory morbidities, including reduced lung function, susceptibility to infections, and risk of early-onset chronic obstructive pulmonary disease (COPD).[1]

Despite significant advances in neonatal medicine, the incidence of BPD remains relatively stable, requiring novel therapeutic strategies.

One such emerging therapy involves the use of mesenchymal stem cells (MSCs) derived from placental tissues. Human placenta, previously regarded as biological waste, is recognised for its regenerative potential. It contains hematopoietic and mesenchymal stem cells capable of differentiating into various cell types, including those with potential to repair lung tissue.[2,3] Placental MSCs demonstrate low immunogenicity, anti-inflammatory effects, and the ability to promote alveolar regeneration—characteristics vital for addressing the pathophysiology of BPD.

Preclinical studies have shown that MSC therapy reverses alveolar damage and improves pulmonary function in animal models.[4] Recent Phase I and II trials have confirmed the safety and feasibility of intratracheal administration of human amnion epithelial cells (hAECs) in preterm infants.[5] Though larger trials are needed to confirm efficacy, initial findings are encouraging.

Given the growing body of evidence and increasing global interest in stem cell-based therapies, we urge the scientific community in Pakistan to consider and contribute to this line of research. Placental stem cell therapy holds significant potential not only in managing BPD but also in transforming neonatal care for preterm infants in resource-constrained settings.

DOI: https://doi.org/10.47391/JPMA.31530

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

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Submission complete: 26-06-2025 **First Revision received:** 08-07-2025

Acceptance: 15-10-2025 **Last Revision received:** 14-10-2025

AUTHOR'S CONTRIBUTION:

SR & ZP: Concept, design, data acquisition, analysis, interpretation, drafting, revision, final approval and agreement to be accountable for all aspects of the work.