

## Congenital Diaphragmatic Hernia Outcomes in a Low-Volume Center

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**Abstract :** Introduction: Congenital diaphragmatic hernia (CDH) is a condition characterized by the herniation of abdominal contents into the thoracic cavity requiring postnatal surgical repair. Previous literature suggests improved CDH outcomes at high-volume regional referral centers compared to low-volume centers. The purpose of this study was to examine CDH outcomes at Kentucky Children's Hospital (KCH), a low-volume center, compared to the Congenital Diaphragmatic Hernia Study Group (CDHSG). Methods: A retrospective chart review was performed at KCH from 2007-2019 for neonates with CDH, and then subdivided into two cohorts: those requiring ECMO therapy and those not requiring ECMO therapy. Basic demographic data and measures of mortality and morbidity including ventilator days and length of stay were compared to the CDHSG. Measures of morbidity for the ECMO cohort including duration of ECMO, clinical bleeding, intracranial hemorrhage, sepsis, need for continuous renal replacement therapy (CRRT), need for sildenafil at discharge, timing of surgical repair, and total ventilator days were collected. Statistical analysis was performed using IBM SPSS Statistics version 28. One-sample t-tests and one-sample Wilcoxon Signed Rank test were utilized as appropriate. Results: There were a total of 27 neonatal patients with CDH at KCH from 2007-2019; 9 of the 27 required ECMO therapy. The birth weight and gestational age were similar between KCH and the CDHSG (2.99 kg vs 2.92 kg,  $p = 0.655$ ; 37.0 weeks vs 37.4 weeks,  $p = 0.51$ ). About half of the patients were inborn in both cohorts (52% vs 56%,  $p = 0.676$ ). KCH cohort had significantly more Caucasian patients (96% vs 55%,  $p < 0.001$ ). Unadjusted mortality was similar in both groups (KCH 70% vs CDHSG 72%,  $p = 0.857$ ). Using ECMO utilization (KCH 78% vs CDHSG 52%,  $p = 0.118$ ) and need for surgical repair (KCH 95% vs CDHSG 85%,  $p = 0.060$ ) as proxy for severity, both groups' mortality were comparable. No significant difference was noted for pulmonary outcomes such as average ventilator days (KCH 43.2 vs. CDHSG 17.3,  $p = 0.078$ ) and home oxygen dependency (KCH 44% vs. CDHSG 24%,  $p = 0.108$ ). Average length of hospital stay for patients treated at KCH was similar to CDHSG (64.4 vs 49.2,  $p = 1.000$ ). Conclusion: Our study demonstrates that outcome in CDH patients is independent of center's case volume status. Management of CDH with a standardized approach in a low-volume center can yield similar outcomes. This data supports the treatment of patients with CDH at low-volume centers as opposed to transferring to higher-volume centers.

**Keywords :** ECMO, case volume, congenital diaphragmatic hernia, congenital diaphragmatic hernia study group, neonate

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