

OXYGENATION INDEX AS AN OBJECTIVE PREDICTOR OF OPTIMAL TIMING FOR SURGERY IN CONGENITAL DIAPHRAGMATIC HERNIA

Yew-Wei Tan¹, Kamal Ali², Gwendolyn Andradi¹, Lekshmi Sasidharan¹, Anne Greenough², Mark Davenport¹

¹Dept. Paediatric Surgery, Kings College Hospital, London, UK, ²Dept. Neonatology, Kings College Hospital, London, UK

Aim of the study: Optimal timing for surgery in CDH is based on subjective clinical assessments of physiological variables. We hypothesised that oxygenation index (OI) might have a role in objectively predicting timing for surgery. We aimed to establish association of OIs with age at surgery (AS), ICU ventilation days (VD) and length of stay (LOS).

Methods: Retrospective review of live-born antenatally-diagnosed CDH repaired during 2009-2015. OI was defined as mean airway pressure (MAP, cmH₂O) x FiO₂ (%) / PaO₂ (mmHg). OI within the first 48 hours were calculated at 6-hour intervals. Correlation of AS, VD and LOS with three OI variables - pre-operative OI (PreOI), and mean OI day1 & day2 (MOI_{d1&2}), were established. Spearman's correlation coefficient (r_s) determined correlations as weak (<0.4), moderate (0.4-0.6), or good (>0.6); continuous data were presented as median (range). $P \leq 0.05^*$ and $P \leq 0.01^{**}$ were statistically significant.

Main results: 44 infants [gestation 37(32-42) weeks, birth weight 2.8 (1.7-4.0)kg, FETO in 20(46%)] underwent surgery at day 5(2-19) with a median PreOI 2.4 (0.9-5.6) (FIGURE). Median VD and LOS were 11 (3-57) and 29 (9-231) days respectively. There was one (2%) late death. There was moderate correlation between AS & VD ($r_s=0.57^{**}$) and AS & LOS ($r_s=0.49^{**}$), and good correlation between VD & LOS ($r_s=0.75^{**}$). MOI_{d1&2} had moderate correlation with timing of surgery ($r_s=0.40^{**}$ and 0.50^{**}) but no or weak correlation with VD ($r_s=0.27$ and 0.33^*) and LOS ($r_s=0.16$ and 0.10).

Conclusions: Timing of surgery and outcome does not appear to be preordained with only a limited relationship between these measures and OI calculated in the first 48 hours of life. Dynamic assessment of day to day respiratory indices and clinical course are more realistic determinates of optimal timing.

