

BEST AND SERIAL OXYGENATION INDICES AS PREDICTORS OF SURVIVAL 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: Best oxygenation index (OI) on day1 (BOld1) is known to be strongly predictive of survival in CDH with a previous study showing that BOld1>11 was associated with mortality. However, BOld1 could reflect aggressive cardiorespiratory support, which may be unsustainable, and limit its clinical application. We investigated whether serial OI assessments in the form of mean OI on d1 (MOld1) could improve predictability of survival compared with BOld1.

Methods: Retrospective review of live-born antenatally-diagnosed CDH in 2009-2015 with available blood gas analyses. OI was defined as mean airway pressure (MAP, cmH₂O) x FiO₂ (%) / PaO₂ (mmHg). OI for the first 24 hours were calculated at 6-hour intervals. Primary end point was 30-day mortality. BOld1 and MOld1 were tested using ROC analysis to identify appropriate cut-off levels. Statistics: continuous data as median (range), comparisons used Mann-Whitney U-test, P-value ≤0.05 was regarded as significant.

Main results: Survivors (n=44) and non-survivors (n=24) were comparable in terms of gestation (38 vs 37 weeks; P=0.28), birth weight (2.9 vs 2.8Kg; P=0.96), and FETO (43% vs 38%; P=0.65). One non-survivor had undergone surgery. Compared to survivors, non-survivors had higher BOld1 (15.4 vs 2.9, P<0.0001) and MOld1 (48 vs 7.5, P<0.0001).

ROC analyses showed that BOld1 (AUC 0.94, P<0.0005) and MOld1 (0.97, P<0.0005) were both excellent predictors of mortality. Selected BOld1 cut-offs were 6(sensitivity 92%, specificity 89%) and 11(sensitivity 67%, specificity 95%), and MOld1 was 17 (sensitivity 96%, specificity 96%) (**Figure**). The positive likelihood ratio for 30-day mortality using BOld1>6, BOld1>11, and MOld1>17 were 8, 14 and 21 respectively.

Conclusion: BOld1 and serial OI were excellent predictors of 30-day mortality, with serial (i.e. mean) OI offering higher sensitivity and specificity. The likelihood of mortality can be reliably predicted with the cut-off defined in this study.

