ADAPTED ECMO ENTRY CRITERIA FOR NEWBORNS WITH PERSISTENT PULMONARY HYPERTENSION (PPHN) FOLLOWING TREATMENT WITH INHALED NITRIC OXIDE (INO) AND/OR HIGH-FREQUENCY OSCILLATORY VENTILATION (HFOV)

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Background and aim: ECMO entry criteria were developed before introduction of iNO and/or HFOV as conservative treatment in newborns with PPHN. Its use reduces ECMO need in good responders. In partial responders it will prolong the conservative treatment and delay starting of ECMO, which may induce lung damage. The aim of this study is to identify AaDO₂ values in early stage which will predict the newborns, who will fail treatment with iNO and/or HFOV and ECMO is ultimately needed.

Methods: In a retrospective study (2002-2007) 134 term newborns with PPHN were included. In 57 partial responders, we determined the differences in the decline of AaDO₂ during 72h of iNO and/or HFOV treatment and in the value of AaDO₂ after these 72h between newborns that ultimately did ($n=11$) and did not ($n=46$) need ECMO.

Results: After 72h, partial responders not requiring ECMO showed a more profound AaDO₂ decrease compared to those who ultimately needed ECMO (median decline 259 (IQR 145-357) vs. 35 (IQR -15-123) mmHg; $p=0.0004$). A decline < 123 mmHg in 72h predicted ECMO need (sensitivity 82%, specificity 80%). At 72h, AaDO₂ was significantly lower in partial responders without ECMO need (335 (IQR 246-470) vs. 570 (IQR 455-590) mmHg; $p=0.0006$). An AaDO₂ > 561 mmHg at 72h predicted ECMO need (sensitivity 64%, specificity 95%).

Conclusions: Term newborns with PPHN showing an AaDO₂ > 561 mmHg or a decline in AaDO₂ < 123 mmHg (20%) compared to baseline after 72h of iNO and/or HFOV treatment should be considered candidates for ECMO.