What timepoint to consider to make an accurate prognosis after pediatric ARDS and ARDS onset?

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Oxygenation measured at PARDS (pediatric acute respiratory distress syndrome) and ARDS (acute respiratory distress syndrome) onset poorly predicts the risk of death of both syndromes. Villar and coworkers suggested a categorization based on both PaO_2/FiO_2 and PEEP (positive end-expiratory pressure) values, measured 24 hours after the initial diagnosis of ARDS, for a better hospital mortality prediction (1). These findings had an external validation with cohorts of Netherlands and Brazil (2) that confirmed that PaO_2/FiO_2 ratio obtained after 24 hours better predict ARDS mortality than onset PaO_2/FiO_2. Why the 24 hours oxygenation can categorize ARDS mortality better than the initial oxygenation is not clear, but these observations were also detected in the pediatric population (3-5). One possible explanation is the fact that after intubation, the adjustment of mechanical ventilation and the start of the medical treatment, the ARDS patients stabilize along the time, making the prognostication after 24 hours significantly better than at ARDS onset.

Recently, it was published in the *Critical Care Medicine*, the article by Yehya and colleagues (6) entitled: "Risk Stratification using Oxygenation in the First 24 hours of Pediatric Acute Respiratory Distress Syndrome" where the authors tested the hypothesis that measuring oxygenation at time points during the first 24 hours after ARDS diagnosis (6, 12, 18 and 24 hours) would maintain predictive validity regarding mortality, ventilator free days at 28 days, ventilator days in patients that survived and probability of extubation, in PARDS. The authors measured Oxygenation index (mean airway pressure FiO_2 ×100) and PaO_2/FiO_2 ratio in 459 children who full-field the diagnosis of pediatric ARDS at the Children's Hospital of Philadelphia at beginning of ARDS and after 6, 12, 18 and 24 hours. The authors observed that all the studied time points but not the onset timepoint, for both PaO_2/FiO_2 ratio and oxygenation index, had good discrimination and calibration (area under receiver operating curve) to predict ventilator days in the survivors, ventilator free days at 28 days, probability of successfully extubation and to predict mortality for PARDS. The utility for oxygenation to predict mortality at 12 hours was confirmed in an external and independent validity cohort at the Children's Hospital of Los Angeles.

This paper revisited the utility of PaO_2/FiO_2 and Oxygenation index as a predictive index of PARDS mortality and introduce the news that both can be used as a mortality predictor as soon as 6 to 12 hours after the onset of the syndrome. These results can introduce crucial implications in the design of future clinical trials as the early intervention in important decisions during mechanical ventilation as the early use of curare, prone position, ECMO and even monitored recruitment maneuvers and ideal PEEP titration. If this good news will also be valid for adult ARDS, it should still be the subject of future studies.

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Footnote

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