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Diaphragmatic Shortening Fraction and Pulmonary Ultrasound Combined Analysis For Extubation Success Prediction in Critical Care Patients

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Invasive respiratory support is a cornerstone of Critical Care Medicine, however, protocols for withdrawal of mechanical ventilation are still far from perfect. Failure to extubation occurs in up to 20% of patients, despite a successful spontaneous breathing trial (SBT). We prospectively included ventilated patients admitted to medical and surgical intensive care unit in a university hospital in northern Mexico. At the end of a successful SBT, we measured Diaphragmatic Shortening Fraction (DSF) at the end of inspiration and at the end of expiration, and the presence of B-lines in five zones of the right and left lung. The primary objective was to determine whether analysis of DSF and Pulmonary Ultrasound improves prediction of extubation success. Eighty-two patients were included, 24 (29.2%) failed to extubation. At univariate analysis, DSF (Youden's J: > 30% [sensitivity and specificity 62 and 50%, respectively]) and number of B-lines zones (Youden's J: > 1 zone [sensitivity and specificity 66 and 92%, respectively]) were significant related to extubation failure (area under the curve 0.664 [0.526 to 0.801] and 0.819 [0.703 to 0.934], respectively). At the binomial logistic regression, only the number of B-lines zones remains significantly related to extubation failure (OR 5.91 [2.33-14.98], $p < 0.001$). In patients with a successfully SBT, the absence of B-lines significantly decreases the probability of extubation failure. DSF analysis does not add predictive power over the use of pulmonary ultrasound.

Biography

Claudia Paola Rivera Uribe has completed her medical school at the age of 24 years from Guadalajara University and postgraduate studies from Nuevo León Autonomous University. She is Chief of Residents of Pulmonary and Critical Care Medicine.

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