

Using Pleth Variability as a Triage Tool for Children with Obstructive Airway Disease in a Pediatric Emergency Department.

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OBJECTIVES: Patients with obstructive airway disease have varying degrees of pulsus paradoxus that correlate with illness severity. Pulsus paradoxus can be measured using plethysmography. We investigated whether plethysmograph (pleth) variability on admission to the pediatric emergency department (ED) could predict patient disposition. We hypothesized that patients with a larger pleth variability would have a higher likelihood of being admitted to a general pediatrics unit or the intensive care unit (ICU).

METHODS: We conducted a prospective single-center study of children aged 1 to 18 years who presented to a pediatric ED with a diagnosis of asthma or reactive airway disease. The pleth variability index (PVI) was calculated from their initial plethysmography tracing. Disposition from the ED was recorded as discharge, admission to the floor, or admission to the ICU.

RESULTS: A total of 117 patients were included in our study. Forty-eight patients were discharged home, 61 were admitted to the floor, and 8 were admitted to the ICU. The median PVI for each of these groups was 0.27 (interquartile range [IQR], 0.19-0.39) for discharges, 0.29 (IQR, 0.20-0.44) for patients admitted to the floor, and 0.56 (IQR, 0.35-0.70) for patients admitted to the ICU. A Kruskal-Wallis test demonstrated a significant difference in the PVI between each of the groups ($P = 0.0087$).

CONCLUSIONS: Our results suggest that PVI may be a useful tool in the triage of children who present to the ED with obstructive airway disease. Further studies should aim to assess the validity of PVI in predicting the response to bronchodilator therapy during the course of a patient's hospitalization.