Assessing Severity in Pediatric Pneumonia: Predictors of the Need for Major Medical Interventions

Berg, Are Stuwitz MD; Inchley, Christopher Stephen MBChB, PhD; Fjaerli, Hans Olav MD, PhD; Leegaard, Truls Michael MD, PhD; Nakstad, Britt MD, PhD
Pediatric Emergency Care: Post Author Corrections: May 23, 2017

doi: 10.1097/PEC.0000000000001179

Original Article: PDF Only

Abstract

Objective

The aim of this study was to determine potential predictors of the need for major medical interventions in the context of assessing severity in pediatric pneumonia.

Methods

This was a prospective, cohort study of previously healthy children and adolescents younger than 18 years presenting to the pediatric emergency room with clinically suspected pneumonia and examining both the full cohort and those with radiologically confirmed pneumonia. The presence of hypoxemia (peripheral oxygen saturation $\leq 92\%$), age-specific tachypnea, high temperature ($\geq 38.5^\circ\text{C}$), chest retraction score, modified Pediatric Early Warning Score, age, C-reactive protein, white blood cell (WBC) count, and chest radiograph findings at first assessment were analyzed by univariate and multivariate analyses to examine their predictive ability for the need for major medical interventions: supplemental oxygen, supplemental fluid, respiratory support, intensive care, or treatment for complications during admission.

Results

Fifty percent of the 394 cases of suspected pneumonia and 60% of the 265 cases of proven pneumonia were in need of 1 or more medical interventions. In multivariate logistic regression, only the presence of hypoxemia (odds ratios, 3.66 and 3.83 in suspected and proven pneumonia, respectively) and chest retraction score (odds ratios, 1.21 and 1.31, respectively for each 1-point increase in the score) significantly predicted the need for major medical interventions in both suspected and proven pneumonia. Specificity of 94% or greater, positive likelihood ratio of 6.4 or greater, and sensitivity of less than 40% were found for both hypoxemia and chest retraction score in predicting major medical interventions. C-reactive protein and white blood cell count were not associated with the need for these interventions, whereas multifocal radiographic changes were.

Conclusions

Hypoxemia and an assessment of chest retractions were the predictors significantly able to rule in more severe pneumonia, but with a limited clinical utility given their poor ability to rule out the need for major medical interventions. Future validation of these findings is needed.

Disclosure: The authors declare no conflict of interest.

Reprints: Are Stuwitz Berg, MD, Department of Pediatric and Adolescent Medicine, Akershus University Hospital, Postal Box 1000, 1478 Lørenskog, Norway (e-mail: arebe@medisin.uio).

A.S.B. received research grants from Akershus University Hospital and South-Eastern Norway Regional Health Authority. The study received grants for running expenses from the Grimsgaard Foundation and the Norwegian Organization for Surveillance of Antimicrobial Resistance. These sponsor had no part in conducting the study, and all researchers were independent of the sponsors.

Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.