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Emergency department visit count: a practical tool to predict asthma hospitalization in children

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Abstract

Objectives: Resource limitations and low rates of follow-up with primary care providers currently limit the impact of emergency department (ED)-based preventative strategies for children with asthma. A mechanism to recognize the children at highest risk of future hospitalization is needed to target comprehensive preventative interventions at discharge. The primary objective of this study was to determine whether frequency of ED visits predicts future asthma hospitalization in children. **Methods:** Children aged 2-16.99 years with asthma ED visits between 2012 and 2015 were identified through health administrative data. Survival analysis using Kaplan-Meier estimator and multivariable Cox regression models with time-varying covariates were used to quantify the number of ED visits in the previous year that would best predict hospitalization risk in the following year, after adjustment for age, sex, and presentation severity. **Results:** We identified 2669 patients with 3300 asthma ED visits. ED visit count was an independent predictor of future hospitalization risk ($p < 0.001$), demonstrating a dose-dependent response. Compared with zero previous visits, the adjusted hazard of future hospitalization in children with one visit or two or more visits was 2.9 (95% CI 1.6-5.0) and 4.4 (95% CI 1.9-10.4), respectively. **Conclusions:** ED visit count is a reliable predictor of future asthma hospitalization risk. Future studies could aim to validate these findings to support using ED visit count as a practical and objective tool to predict the children at the highest risk of future hospitalization and therefore, those who may benefit most from ED-based preventative interventions.

Keywords: Predict; emergency department-based; frequency; future; preventative; risk.

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