

Serious Outcomes of Medically-Attended, Laboratory-Confirmed Influenza Illness among School-Aged Children with and without Asthma, 2008-2018

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Background: Asthma is the most common comorbidity reported among children hospitalized with influenza and was reported with high frequency among children hospitalized during the 2009 H1N1 pandemic. The objectives of this study were to assess whether school-aged children with asthma are at increased risk of serious outcome following medically-attended influenza illness and examine whether influenza vaccination modifies the association between asthma and serious outcome.

Methods: We analyzed data from children 5 to 17 years of age with medically-attended, laboratory-confirmed influenza who were enrolled in the Influenza Vaccine Effectiveness Study at Marshfield Clinic between 2007 and 2018 (excluding the 2009-10 pandemic). A serious outcome was defined as hospitalization, emergency department visit, or pneumonia diagnosis within 30 days of symptom onset. A multivariable logistic regression model examined the association between asthma and a serious influenza-related outcome with adjustment for potential confounders. Effect modification by vaccination status was assessed with an interaction term.

Results: The analysis included 1,687 children with influenza. The median age was 10 years, 27% had asthma, and 28% were vaccinated. There were 94 serious outcomes, including 7 hospital admissions. The odds of a serious influenza-related outcome was similar for children with and without asthma [adjusted odds ratio (aOR) 1.37, 95% confidence interval (CI) 0.87, 2.16]. Among children without asthma, influenza vaccination significantly decreased the odds of serious influenza-related outcome [aOR 0.46, 95% CI 0.23, 0.92]. Influenza vaccination was not significantly associated with reduced odds of serious outcome among children with asthma [aOR 1.15, 95% CI 0.55, 2.40].

Conclusions: Most serious outcomes in this study did not require hospital admission, and asthma was not significantly associated with increased odds of serious influenza-related outcome. Studies in larger populations are needed to assess vaccination and influenza severity in children with asthma.