

ORIGINAL ARTICLE

**Association between celiac disease and pneumococcal infections in hospitalized pediatric patients in the United States**

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**Abstract**

Objective

Celiac disease (CD) is an immune-mediated enteropathy that is associated with pneumococcal infections in adults. The objective of this study is to evaluate the association between CD and pneumococcal infections in hospitalized pediatric patients in the United States (US).

Study Design

The triennial Healthcare Cost and Utilization Project Kids' Inpatient Database was used in a retrospective analysis of children hospitalized in the US from 1997 to 2019. Billing codes were used to define patients with CD who were admitted with *Streptococcus pneumoniae* speciated infections or an infection commonly caused by *S. pneumoniae*. A multivariable logistic regression model was used to quantify increased odds of various types of infections for patients with CD.

Results

Among 55,080,914 pediatric hospital admissions, 15,412 were identified with CD, and 1,722,872 were admitted with the specified infections. CD was associated with both pneumococcus speciated infections (odd ratio [OR], 2.16, 95% confidence interval [CI], 1.38-3.38) and infections commonly caused by *S. pneumoniae* (OR, 1.78; 95% CI, 1.61−1.96): pneumonia (OR, 1.70; 95% CI, 1.53−1.89), sinusitis (OR, 2.41, 95% CI, 1.76−3.30), and bacteremia (OR, 2.12; 95% CI, 1.56−2.88). Patients with CD had a significantly longer length of stay (*p* < 0.001) and a greater cost of hospitalization (*p* < 0.001) with pneumococcus associated infections.

Conclusions

CD is associated with an increased risk of both pneumococcus speciated and pneumococcus-associated infections requiring hospitalization. CD admissions are associated with longer hospital stays and higher costs without increased risk of death. Routine pneumococcal vaccinations are strongly recommended for pediatric patients with CD.

**Highlights**

What is Known

* Adult patients with celiac disease (CD) have been shown to have an increased risk of pneumococcal infections, such as pneumonia.
* Hyposplenism has been associated with adults with CD, but the true impact of this finding is not yet clear.
* At this time, the expanded pneumococcal polysaccharide vaccine is not specifically recommended for patients with CD.

What is New

* There is an increased risk of hospitalization of pediatric patients with CD due to both pneumococcus speciated and associated infections, such as pneumonia, bacteremia, and sinusitis.
* Hospitalized pediatric patients with CD are found to have admissions complicated by significantly longer hospital stays and higher costs.