Seasonality of Asthma Emergency Department Visits Among Tennessee Children
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BACKGROUND

- Asthma is characterized by episodic, reversible airflow obstruction and may also include airway hyper-responsiveness.
- It is the third leading cause of hospitalization for children and one of the most common childhood chronic diseases.
- Triggers for asthma attacks are not well understood but include exercise, tobacco smoke, air pollution and aeroallergens.
- Poor asthma management leads to asthma attacks which can result in emergency department (ED) visits and hospitalizations.
- Seasonality of asthma has been observed in many studies, but has not yet been studied extensively in TN children.

STUDY QUESTION

What is the seasonality pattern of asthma ED visits in Tennessee children ages 5-17?

METHODS

- The 2005-2009 Tennessee Hospital Discharge Data System (HDDS) was used to identify ED visits among TN children ages 5-17 years old with a primary diagnosis of asthma (ICD9-CM code 493).
- The Fisher-Kappa (FK) and Bartlett Kolmogorov Smirnov (BKS) statistics were used to detect periodicity in asthma ED visits from 2005-2009.
- Chi square tests were used to assess differences in patient characteristics between the fall (September-November) and the non-fall (December-August) for ED admissions.
- A five year monthly average was used to describe seasonality by age group, gender, race, rural/urban residence, and health insurance type.

RESULTS

- Between 2005-2009 there were 43,159 ED visits among children ages 5-17 due to asthma.
- Results show a consistent pattern of fall peaks and summer troughs regardless of age, gender, race, rural/urban residence or health insurance type.
- All FK values were statistically significant and p-values from BKS were <0.001, indicating a seasonality of asthma ED visits.
- Comparisons of ED visit rates among sub-populations: Male > Female (Figure 2.)
  - Black > White (Figure 2.)
  - Ages 5-8 > Ages 9-12 > Ages 13-17 (Figure 3.)
  - Urban Residents > Rural Residents (Figure 4.)
- Comparisons of ED visit counts1 by health insurance type:
  - TennCare > Private Insurance (Figure 5.)
- There was a higher percentage of younger, male, black, and urban children admitted to the ED in the fall compared to non-fall admissions (p<0.001).
- Between 2005-2009, a downward trend in the magnitude of fall peak asthma ED visits was observed overall (Figure 1.) and in all subpopulations (data not shown).
- The largest decrease was seen in black children (34% decrease).

DISCUSSIONS

- Understanding the seasonality pattern of asthma ED visits can help guide the planning process of asthma management and intervention.
- Regardless of socio-demographic differences, seasonal variations for asthma ED visits in TN children were consistent with other studies.
- Increased rates of childhood asthma hospitalizations have been found internationally to coincide with the return to school despite differences in school schedules.
- Fall peaks, and summer troughs are seen in TN children, with a greater percentage of fall admissions consisting of younger, male, black, and urban residents.
- Other factors associated with asthma attacks such as air quality or simultaneous viral infections were not assessed.
- Return to school in the fall provides an opportunity for increased spread of viral infections which are uncommon in the summer. Also when children are not in school they may better utilize preventive medications.
- The disparities in ED visits between blacks and whites may be due to poor preventative care.
- National data shows that white children have physician office visits for asthma more often than black children (96.2% and 31.1%, respectively)
- Returning to school offers many opportunities to couple education and training on asthma management to asthmatic children and their parents.

CONCLUSIONS

- There were seasonal variations in asthma ED visits in TN children from 2005-2009. The highest rates of admissions occurred in the fall months and a greater percentage of children admitted during this time were younger, male, black and urban residents.

REFERENCES