

Inner City Asthma



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KEYWORDS

• Asthma • Inner city • Severity • Poverty • Disparities • Intervention

KEY POINTS

- Inner cities are areas of high asthma morbidity and mortality.
- Many asthma risk factors present; no single one predominates.
- Structure and function of medical care contribute to the problem.
- Social inequities contribute to the problem.
- Successful interventions exist.

SCOPE OF THE PROBLEM

Prevalence

In the United States, asthma prevalence increased at a rate of 1.4% per year between 2001 to 2010 in children and adolescents 17 years and younger, so that by 2008 to 2010, the prevalence reached 9.5%.¹ Asthma prevalence varies among racial/ethnic groups; African American children have 1.6 times the level of current asthma than white children.² Asthma prevalence varies greatly in the Hispanic groups in the United States. Puerto Rican children have among the highest prevalence, approximately 2.4 times that of white children, whereas Mexican American children have levels lower than white children.^{2,3} Differences in prevalence can represent true differences in disease or differences in diagnosis. An analyses of children aged 3 to 17 years with reported wheezing in the past year from the 1999 National Health Interview Study (NHIS) found that compared with non-Hispanic white children, the adjusted relative risk for reporting a diagnosis of asthma was increased for Puerto Rican (1.43), non-Hispanic black (1.22), and Mexican American children (1.19),⁴ suggesting that part of the reported differences in prevalence can be explained by differential rates of diagnosis.

In addition to varying in different racial/ethnic groups, asthma prevalence can vary both across and within neighborhoods. Neighborhoods with the highest asthma prevalence tend to have high minority concentration and low income levels. In Chicago, the neighborhood prevalence of asthma ranges from 0% to 44%, with the highest levels

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seen in African American and Hispanic neighborhoods.⁵ Within a single neighborhood in New York City, asthma prevalence has been reported at 5.3% for Dominicans and other Latinos versus 13.2% for Puerto Ricans.⁶

The factors contributing to the high prevalence of asthma in Puerto Rican children are not clear. Despite having higher socioeconomic status (SES), lower rates of prematurity, and less exposure to prenatal smoke exposure, the prevalence of asthma is higher in Puerto Rican children living in Puerto Rico compared with Puerto Rican children living in the south Bronx.⁷ Differences in prevalence between island resident Puerto Rican children and those living in the US mainland are not caused by increased severity when Global Initiative for Asthma severity criteria and pulmonary function are considered, but island Puerto Rican children have a higher rate of emergency room visits and lowest use of inhaled steroids.⁸ Differences in perception of disease may contribute to the differences noted in Puerto Rican children. Comparison of subjective estimates of peak expiratory flow rates (PEFR) compared with measurement of PEFR over a 5-week period in 512 children aged 7 to 16 years living in Puerto Rico and Rhode Island found that island Puerto Ricans had the lowest accuracy of estimating their PEFR, with Rhode Island Latinos better. However, both groups were significantly worse than non-Hispanic white children. The investigators also reported that self-reported asthma morbidity increased as ability to estimate the pulmonary function decreased.⁹

Morbidity and Mortality

Data from a national database report in 2006 indicated that asthma was the reason for 3.4 million visits to physician offices, 500,000 visits to hospital outpatient departments, 593,000 emergency visits, and 155,000 hospitalizations. In 2005, there were 167 deaths from asthma in children and adolescents (most asthma deaths occur in the elderly). African American children and adolescents had a 7.6 times higher death rate, 2.6 times higher emergency department (ED) visits, 3 times higher hospitalization, but 20% lower nonemergency asthma ambulatory care than whites. Data on Hispanics at the national level are more limited, but ED usage by this ethnic group is approximately double that of whites, although there is a similar asthma death rate. The magnitude of the disparity between white and African American children is confounded by the approach taken in analyzing the data. Asthma morbidity and mortality data for children 0 to 17 years of age collected by the National Center for Health Statistics found between 2001 and 2010 show that racial disparities have remained unchanged if the rates are based on the total population. If, however, rates are calculated based on the number of children with asthma within each racial group, a disparity for asthma attack prevalence is no longer evident and the level of disparity for ED visits and hospitalization is decreased. However, the disparity in asthma mortality remains.¹⁰

CONTRIBUTING FACTORS

Disease Severity

Reduced responsiveness to therapy for intrinsic or extrinsic reasons has been considered as a possible explanation for the higher rates of morbidity and mortality found in poor and minority children and adolescents. However, several studies such as the Inner City Asthma Consortium ACE (Asthma Control Evaluation) study¹¹ and the BreathMobile¹² found that, after providing high-quality, comprehensive asthma care and the ability to obtain the needed medication, most poor and minority children and adolescents with asthma can be well controlled.

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