Life Course Disability Risks of Asthma: Does Age of Asthma Onset Matter?

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Background and Contributions

- Nearly 3 of every 5 individuals with asthma limit activity. Limiting activity has been associated with greater long-term risks of declining physical and cognitive function, and with more disability.
- Asthma symptoms are often intermittent for children but persistent after adult onset, when occupational or non-occupational triggers can exacerbate asthma.
- We examined life course associations of asthma with disability in activities of daily living (ADLs) such as dressing or walking, and instrumental ADLs (IADLs) such as shopping or managing money, using multinomial logistic Markov models adjusted for age, education, sex, race/ethnicity, and asthma status (no asthma, childhood asthma only, childhood asthma with disability, adult asthma only, adult asthma with disability).
- We hypothesized that individuals with childhood asthma would have more disability throughout adult life than those without asthma, and that people with adult onset asthma would have even more disability.

Data and Analytical Methods

We used data representing individuals of all adult ages from the Panel Study of Income Dynamics (PSID) and the 2014 PSID Childhood Retrospective Circumstances Study (1992-2013; n=6,682; 29,117 functional status transitions). We estimated annual probabilities associating childhood and adult asthma with disability in activities of daily living (ADLs) such as dressing or walking, and instrumental ADLs (IADLs) such as shopping or managing money, using multinomial logistic Markov models adjusted for age, education, sex, race/ethnicity, and asthma status (no asthma, childhood asthma only, childhood asthma with disability, adult asthma only, adult asthma with disability). With the probabilities we created large populations with microsimulation, measuring IADL and ADL status each year for each individual, age 25 through death, the prevalence of disability and dependency at each age, and the average remaining life from each age with IADL and ADL impairments. Bootstrapping accounted for parameter uncertainty and Monte Carlo variation.

Summary of Results

African American men exemplify results. At age 50, among those without childhood or adult asthma, 7.1% had difficulty doing an ADL, and 4.9% needed help to do an ADL, compared with 11.6% and 9.6% of those reporting both childhood and adult asthma, and 18.5% and 15.0% of those with adult onset asthma (p<0.01). The percentage of remaining life with functional impairments was also greater for those with asthma, particularly large for those with adult onset asthma. Higher prevalence of IADL impairment and the larger percentage of remaining life with IADL impairment may indicate that participants with asthma were more likely to have impaired cognitive function than others. This result is consistent with research suggesting that people with asthma may limit physical activity, and that physical activity is associated with cognitive health. Results were similar for African American and white women, and at other adult ages.

Discussion

People with asthma have greater risks than others of functional status impairments throughout adult life, including greater needs for assistance with activities of daily living, with particularly high risks for those who first develop asthma as adults. The retrospective measurement of childhood asthma may involve recall bias, although research suggests that individuals generally report serious childhood illnesses accurately. Participants were interviewed in 2014 so we could not model the association of asthma with mortality; we simulated each group through its average age of death using estimates from the National Center for Health Statistics.

Further research is needed to determine whether greater disability associated with asthma is due to reduced lung function, reduced physical activity and fitness, or other factors associated with asthma. Researchers should also examine how asthma management interventions may affect the association of asthma with impaired functional status throughout adult life.

Related Research
