Coexistent Chronic Conditions and Asthma Quality of Life*

A Population-Based Study

Robert J. Adams, MD; David H. Wilson, PhD; Anne W. Taylor, MPH; Alison Daly, BA; Edouard Tursan d'Espaignet, PhD; Eleonora Dal Grande, MPH; and Richard E. Ruffin, MD

Objective: **Reports of the prevalence and impact of comorbid conditions among people with asthma have been limited to certain population groups or convenience samples. Our aim was to examine the prevalence of major comorbidity in asthma and associations with quality of life and functional status in the general population.**

Study design/setting: **The WANTS Health and Well-being Survey is a cross-sectional representative population household telephone interview survey in three Australian states.**

Participants: **Representative sample of noninstitutionalized adults in three Australian states.**

Measurement and results: **From the available sample of 10,080 patients, 7,619 interviews were completed (participation rate, 74.8%), with 834 people reporting current doctor-diagnosed asthma (11.2%). People with asthma were more likely to report one of the selected comorbid conditions: diabetes, arthritis, heart disease, stroke, cancer, osteoporosis (adjusted odds ratio, 1.9; 95% confidence interval, 1.5 to 2.2). Among people with asthma, there were statistically and clinically significant decreases in usual activity levels and in Short Form-12 physical component summary scores when another chronic condition was also present. For those with any of the chronic conditions, the additional presence of asthma was associated with significant further impairment in quality of life in those aged > 35 years but not in younger adults.**

Conclusion: **The significant reduction in quality of life associated with comorbidity in asthma has implications for disease management and organization of care, as well as for the design and external validity of single-disease clinical trials.** ***(CHEST 2006; 129:285–291)***

Key words: asthma; comorbidity; population study; quality of life

Abbreviations: CI = confidence interval; PCS = physical component summary; SF-12 = Short-Form 12

Asthma in adults accounts for significant morbidity[1] and cost to the community.[2] However, there is minimal published information on comorbid conditions associated with asthma. Such information that is available has mostly come from convenience samples or clinic populations, making conclusions as to the generalizability of the results limited. In a study from primary care, Ben-Noun[3] found that the prevalence of comorbidities differed between people with and without asthma. While gastric ulcers, sinusitis, and glaucoma were seen more frequently, other major chronic conditions such as diabetes and car-

*From the Health Observatory (Drs. Adams, Wilson, and Ruffin), Queen Elizabeth Hospital Campus, University of Adelaide, South Australia; Population Research and Outcome Studies Unit (Ms. Taylor and Ms. Dal Grande), Department of Health, South Australia; Health Outcomes Assessment Unit (Ms. Daly), Department of Health, Western Australia; and Population Health Division (Dr. Tursan d'Espaignet), Newcastle University, NSW.
Funding was provided by the Commonwealth of Australia Department of Health and Aged Care; Department of Human Services South Australia; Department of Health Western Australia; and Northern Territory Department of Health.

Manuscript received March 29, 2005; revision accepted June 30, 2005.

Correspondence to: Robert J. Adams, MD, Department of Medicine, University of Adelaide, The Queen Elizabeth Hospital, Woodville Rd, Woodville, SA 5011, Australia; e-mail: robert.adams@nwahs.sa.gov.au

diovascular disorders were not more common among people with asthma.[3] Diette et al[4] reported that comorbid conditions were more common in older than younger asthma patients but were unable to compare asthma patients with asthma with patients without asthma.

The influence of comorbidity on quality of life and functional status has also not been extensively studied in asthma. Asthma has been associated with a greater likelihood of preventable hospitalization in people with diabetes.[5] Wijnhoven et al[6,7] reported that comorbidity was a determinant of quality of life in adults with asthma and has been linked to asthma deaths.[8] These studies were unable to compare asthma with a nonasthma population; thus, the relative effect of comorbidity in asthma compared with others remains unclear. Xuan et al[9] examined data from controlled clinical trials to find that comorbid conditions significantly affected scores on generic quality of life measures and estimation of treatment effect in asthma. The authors[9] noted that these findings had significant practical implications for the estimation of treatment effects, and design of trials. The extent of this problem, particularly in the elderly, is unknown. Many asthma clinical trials[10,11] exclude people with comorbid conditions. Consequently, the degree to which clinical trials are reflective of the actual population with asthma is also unclear. This has major potential implications for the external validity of single-disease intervention trials.[12]

The objective of this study was to compare the prevalence of common, significant medical conditions in adults with and without asthma in the general population. We also compared the influence of comorbid chronic health conditions on physical health quality of life and functional status for those with and without asthma. We used data from the Collaborative Health and Well-being Survey, a large population survey of well-being among adults living in Western Australia, the Northern Territory, and South Australia.

Materials and Methods

Study Population

All households in the three jurisdictions with a telephone connected and the number listed in the current version of the electronic white pages were eligible for selection in the sample. Samples were drawn separately for each state. The target number of interviews for each state was 2,500. A stratified sampling technique was used with the distribution of these interviews planned: n = 900 in the metropolitan area, n = 800 in rural areas, and n = 800 in remote areas. The minimum sample size of 800 was necessary to enable population estimates to be made with reasonable confidence intervals (CIs) for the less populated areas of each state. This was particularly so in the rural and remote areas of South Australian and Western Australia, where a random sample of each state would have resulted in a small number of respondents for these areas. As a consequence of the need to oversample nonmetropolitan areas, separate samples were drawn for each of the three geographic regions (metropolitan/rural/remote) for each of the states. These samples represented increasing proportions of the population as remoteness increased. The definitions of remoteness were based on Australian Bureau of Statistics Accessibility/Remoteness Index of Australia codes.[13]

Survey Method

Within each household, the person aged ≥ 18 years who had their birthday last was selected for interview. There was no replacement for persons who could not be contacted or refused to participate. An introductory letter was sent to each selected household from each respective state's health department. Interviews were conducted during 2000 by trained health interviewers using a computer-assisted telephone interview system, with at least six callbacks as needed. The validity of these methods to produce unbiased samples while maximizing response rates has been previously described.[14,15] Demographic data on people who refused participation was also obtained to compare with participants and allow for appropriate weighting in the analyses.

The survey was conducted with the oversight of a management group comprising a member from Health Departments of Western Australia, the Northern Territory, and South Australia, and the Commonwealth of Australia. The introductory letter sent to all potential respondents included a toll-free telephone number to contact with any queries. At the time of the interview all respondents were informed they could refuse to take part without any penalty and were able to terminate the interview at any time. All data were de-identified, and all information was kept strictly confidential. In line with other population surveys, no institutional review board approval was sought.

Survey Items

Current doctor-diagnosed asthma was determined by positive responses to both items asking participants if they had ever been told by a doctor they had asthma and if they still had asthma. No data on clinical asthma variables were available.

Quality of life was measured using the Short Form-12 (SF-12).[16] The SF-12 is a subset of the Short Form-36 and is a valid measure of health status in Australia.[17] Respondents were asked if they had ever been told by a doctor that they have any of the following chronic health conditions: diabetes, arthritis, heart disease, stroke, cancer, osteoporosis (not osteoarthritis). Other items included questions on demographics and number of days unable to do work or usual activities due to health over the past 4 weeks.

Statistical Analysis

Data were analyzed using statistical software (Version 11.0; SPSS; Chicago, IL). Data have been weighted by age, gender, state, and probability of selection in the household.[18] The data were weighted using Australian Bureau of Statistics national population estimates for 1999 so that the health estimates calculated would be representative of the adult population. This was necessary to correct for the disproportionality of the sample with respect to the population of interest. The weights reflect unequal sample inclusion probabilities and compensate for differential nonresponse. This resulted in occasional minor rounding effects for the numbers.