What Is Worse for Asthma Control and Quality of Life*

Depressive Disorders, Anxiety Disorders, or Both?

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Background: **The high burden of asthma appears to be related to poor asthma control. Although previous studies have reported associations between depressive disorders (DDs) and anxiety disorders (ADs) and worse asthma control and quality of life, the relative impact of these disorders on asthma control and quality of life has not been explored. This study evaluated the relative impact of having a DD and/or AD on asthma control and quality of life.**

Method: **Five hundred four consecutive adults with confirmed, physician-diagnosed asthma underwent a brief, structured psychiatric interview using the Primary Care Evaluation of Mental Disorders. Asthma control and asthma-related quality of life were assessed using the Asthma Control Questionnaire (ACQ) and the Asthma Quality of Life Questionnaire (AQLQ). All patients underwent standard spirometry.**

Results: **Thirty-one percent of patients (n = 157) met the diagnostic criteria for one or more psychiatric disorders (8% had DD only, 12% had AD only, and 11% had both). Analyses revealed independent effects for DDs on total ACQ scores ($p < 0.01$), and for DDs and ADs on total AQLQ scores and all four AQLQ subscales ($p < 0.05$). There were no interaction effects.**

Conclusions: **Results suggest that DDs and ADs are associated with worse asthma-related quality of life, but only DDs are associated with worse asthma control. Interestingly, having both a DD and an AD did not confer additional risk for worse asthma control or quality of life. Physicians may want to consider the differential impact of negative mood states when assessing levels of asthma control and quality of life.** ***(CHEST 2006; 130:1039–1047)***

Key words: anxiety disorders; asthma control; depression; depressive disorders; quality of life

Abbreviations: ACQ = Asthma Control Questionnaire; AD = anxiety disorder; ADD = anxiety plus depressive disorder; AQLQ = Asthma Quality of Life Questionnaire; ASI = anxiety sensitivity index; BDI-II = Beck Depression Inventory-II; DD = depressive disorder; DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; ND = no disorder; PRIME-MD = Primary Care Evaluation of Mental Disorders

Asthma is among the four most common chronic disorders affecting adults.[1,2] Despite important advances in diagnosis and treatment, the prevalence of asthma has increased among all age, sex, and racial groups to affect approximately 100 to 150 million people worldwide.[2] Asthma is a multifactorial lung disease that is associated not only with significant medical morbidity, but also has important personal, social, and economic impacts. Asthma has been

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directly related to impaired asthma-related quality of life including increased work and school absences, an inability to perform household chores, and restriction of social activities.[1,3] The total costs of caring for asthma have been calculated by the World Health Organization to exceed those of AIDS/HIV and tuberculosis combined,[2] with costs reaching nearly $13 billion annually in the United States alone.[4]

The availability of effective treatments suggests asthma can be well controlled in most patients.[5,6] However, current trends in asthma prevalence rates and morbidity indicate that asthma remains poorly controlled in the vast majority of patients.[7–9] Criteria for classifying poorly controlled asthma have been published extensively elsewhere[5,10,11] but are generally ascribed when patients exhibit one or more of the following: symptom exacerbations (*eg*, wheezing, nocturnal waking, shortness of breath), functional impairment (*eg*, difficulties engaging in physical activity), reduced pulmonary function, and/or increased bronchodilator use (more than four times in the past week).[5]

Achieving optimal asthma control relies on several behavioral factors (*eg*, self-monitoring, treatment adherence, and managing environmental triggers) that may be influenced by chronic negative mood states.[12–14] Chronic negative mood states such as depression may interfere with daily self-monitoring abilities and treatment adherence,[13,15] which may result in worse levels of asthma control. Interestingly, rates of psychiatric disorders (particularly depressive disorders [DDs] and anxiety disorders [ADs]) have been shown to be up to six times more prevalent among asthma patients (16 to 52% for ADs, and 14 to 41% for DDs) compared to rates observed in the general population.[16–22] We[16] and others[12,17] have previously reported associations between DDs and ADs and worse asthma control and/or asthma-related quality of life. However, the relative impact of these chronic negative mood states on asthma control and asthma-related quality of life was not explored in our previous report, or in any previous studies linking these disorders to worse asthma morbidity. The goal of the present study was to assess the prevalence of DDs and ADs in a sample of adult asthmatics, and to evaluate the relative impact of having a DD only, an AD only, or both, on levels of asthma control and asthma-related quality of life.

Materials and Methods

Study Subjects

A total of 504 consecutive adult patients with physician-diagnosed asthma were recruited from the asthma clinic of Hôpital du Sacré-Coeur de Montréal from June 2003 to March 2005. Patients were eligible if they had a primary diagnosis of asthma, were between the ages of 18 and 75 years, and were fluent in either English or French. A total of 1,243 patients presented to the asthma clinic, of whom 1,094 subjects (88%) were screened for inclusion in the study (the remaining 149 subjects had insufficient medical information with which to conduct prescreening). A total of 550 subjects were excluded (n = 187 due to existence of comorbid disease that conferred greater risk for morbidity than asthma [n = 107 with COPD] or the presence of severe psychopathology or substance abuse [n = 8 had psychoses]; n = 126 due to new or unconfirmed asthma; n = 48 due to primary diagnosis of occupational asthma; n = 142 due to age criteria; and n = 31 due to language criteria), resulting in 553 eligible patients who were contacted to participate in the study. Only 40 patients declined to participate, which yielded a sample of 513 patients (93% participation rate). Nine patients were excluded from analysis due to incomplete or missing data, yielding a final sample of 504 patients. All patients gave written, informed consent, and this project was approved by the Human Ethics Committee of Hôpital du Sacré-Cœur de Montréal.

Study Design

All patients were screened on the day of their asthma clinic visit to verify eligibility. Participants underwent a sociodemographic and medical history interview, including asking patients to report the frequency of bronchodilator use and alcohol consumption in the past week, followed by a brief, structured psychiatric interview (Primary Care Evaluation for Mental Disorders [PRIME-MD]) administered by a trained clinical research assistant. Patients completed an Asthma Control Questionnaire (ACQ) and an Asthma Quality of Life Questionnaire (AQLQ) and underwent standard spirometry[23] to measure pulmonary function. Asthma diagnoses were confirmed by chart evidence of a 20% fall in FEV_1 after methacholine challenge and/or bronchodilator reversibility in $FEV_1 \geq 20\%$ predicted.[24] Asthma severity was classified according to International Global Initiative for Asthma guidelines.[5] Medical history, including medication status and dosage, was self-reported and verified by chart medical review.

Measures

Psychiatric Assessment: The PRIME-MD[25] is a well-validated screening instrument designed to detect the most common disorders listed in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV)[26] seen in primary and tertiary care settings. The PRIME-MD uses diagnostic algorithms to generate current diagnoses based on DSM-IV criteria that have been shown to be of comparable reliability, sensitivity, and specificity as longer structured interviews.[25] The interview begins with a series of screening questions followed by structured interview questions that are used to follow-up patient responses. The PRIME-MD takes from 10 and 20 min to administer and score, and has been used successfully in previous studies[17,27] assessing the prevalence of psychiatric disorders in asthma patients. A trained clinical research assistant with > 5 years experience administering psychiatric interviews administered the mood disorders and ADs modules of the PRIME-MD. The mood disorders module yields diagnoses for current major DD, minor DD, dysthymia, and bipolar disorder; and the ADs module yields diagnoses for current panic disorder, generalized AD, and AD not otherwise specified. Due to the relative frequency of social AD in asthma samples,[20,22] we also adminis-