ECONOMIC BURDEN ATTRIBUTABLE TO OBESITY IN ADULT PATIENTS WITH ASTHMA IN THE U.S.

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OBJECTIVES: To estimate annual medical and productivity costs attributable to obesity in patients with asthma in the U.S.

METHODS: The study used the 2003-2008 Medical Expenditure Panel Survey. Asthma patients (18-64 years) were identified using ICD-9-CM code 493, a clinician classification code 128, or physician diagnosis. Patients were classified as normal (BMI: 18.5-25 kg/m2), overweight (BMI: 25-30 kg/m2) or obese (BMI≥30 kg/m2). Medical costs were estimated using a generalized linear model (GLM) with a log link function and gamma distribution. Costs associated with productivity loss was calculated based on missed working days due to illness and average hourly wage using a two-part model for working adults. In the first part, logistic regression was used to estimate the probability of having missed working days due to illness. In the second part, using patients with missed working days, GLM was used with the estimated probability from first part of model to estimate the cost associated with productivity loss. The costs attributable to obesity were estimated by differences between the observed and estimated cost in obese patients, using a distribution of covariates obtained from normal patients. All costs were converted to 2010 U.S. dollars using price indices. Data were analyzed using SAS and STATA.

RESULTS: A total of 7,717 adults were identified with asthma. The average treatment cost and total productivity costs of normal patients were $3,154 (95%CI: $2,689 - $3,620) and $327 (95% CI: $279 - $375), respectively. Obese patients had 38% higher medical cost and 53% higher total productivity costs after adjusting for other study variates(4). Additional medical costs attributable to obesity were calculated to be $1,087 (95% CI: $687-$1,487) and lost productivity costs attributable to obesity was $279 (95% CI: $191-$368).

CONCLUSIONS: The economic burden of asthma among U.S. adults is substantial, which is only further amplified by the presence of obesity. This study highlights the importance of obesity control in order to reduce costs of treating asthmatic patients and enhance productivity.

BACKGROUND

1. Asthma is a chronic respiratory disease that influences and narrows the airways, characterized by episodic and reversible attacks of wheezing, chest tightness, shortness of breath, and coughing.
2. Obesity is an important factor that affects the progression or deterioration of asthma(1).
3. The prevalence of asthma among adults in 2009 was estimated at 7.7% (2) and the costs attributable to asthma were $2,071.50 per patient among adults(3).
4. A recent study of the US adults indicated that the prevalence of obesity was 33.8% (in 2007-2008). 4

OBJECTIVES

1. To examine the demographic characteristics of obese patients with asthma in the U.S.
2. To estimate the differences in annual medical and productivity costs between obese and normal-weighted patients with asthma

METHODS

Data source

• 2003–2008 Medical Expenditure Panel Survey (MEPS)• MEPS is a nationally representative survey of the U.S. civilian non-institutionalized population starting in 1996, and is designed to collect health care information
• MEPS includes detailed information on health care utilization and expenditures, health insurance, health status, and a variety of demographic, social, and economic characteristics

Study population

Eligible patients were identified if they:
1. Had asthma based on an ICD-9-CM code of 493, a clinician classification code of 128, or confirmed diagnosis of asthma by a physician
2. Were 18-64 years old
3. Did not have pregnancy, malignancy, kidney dialysis, immunodeficiency diseases, or low body-mass index (BMI)>18.5

Obesity

• BMI was calculated by weight (in kilograms) divided by height squared (in meters) using self-reported weight and height
• Patients were classified as normal weight (BMI:18.5-25 kg/m2), overweight (BMI:25-30 kg/m2), or obese (BMI≥30 kg/m2)

Data Analysis

Medical Costs

• Included medical services and prescription drug costs incurred for treating patients, excluding costs associated with dental health and injury • Were estimated using a generalized linear regression model with log link function and gamma distribution after adjusting for patient characteristics and co-morbidities

Productivity loss costs

• Were estimated based on the missed working days due to illness, injury, or mental or emotional problems for one year and valued using the average hourly wage by occupation in the U.S.
• Were estimated using a two part model for working adults because they included substantial zero costs
 1. In the first part, logistic regression was used to estimate the probability of having workdays lost
 2. In the second part, using patient who had non-zero costs, a generalized linear model, utilizing the probability of positive value, was used to estimate the productivity loss costs

LIMITATIONS

• Medical costs and productivity loss costs may be affected by the immeasurable confounders
• The number of patients able to be identified from the MEPS database was low and affected the statistical power of the study
• Use of the reported medical conditions in the MEPS (i.e. ICD-9-CM codes, CDC, the question about asthma) tends to underestimate the true prevalence of asthma due to its chronic nature

CONCLUSIONS

• For asthma patients, the medical costs attributable to obesity was estimated at $1,087 (95%CI: $687-$1,487) and the productivity loss costs attributable to obesity was estimated at $279 (95% CI: $191-$368)
• The economic burden of asthma among US adults is substantial, which is only further amplified by the presence of obesity
• This study highlights the importance of obesity control to reduce the cost of treating asthmatic patients and to enhance productivity

REFERENCES