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ScienceDirect
Research in Social and Administrative Pharmacy 13 (2017) 530–538
RESEARCH IN SOCIAL & ADMINISTRATIVE PHARMACY

Original Research

An evaluation of health care expenditures in Crohn's disease using the United States Medical Expenditure Panel Survey from 2003 to 2013

Mark Bounthavong, Pharm.D., M.P.H.[a,*], Meng Li, M.S.[a], Jonathan H. Watanabe, Pharm.D., Ph.D.[b]

[a] *Pharmaceutical Outcomes Research and Policy Program, University of Washington, USA*
[b] *Skaggs School of Pharmacy and Pharmaceutical Sciences, University of California, San Diego, USA*

Abstract

Background: Previous estimates of the economic burden of Crohn's disease (CD) varied widely from $2.0 to $18.2 billion per year (adjusted to 2015 $US). However, these estimates do not reflect recent changes in pharmaceutical treatment options and guidelines.
Objective: The goal of this study was to update cost estimates of Crohn's disease based on a representative sample of the US population from the most recent 11 years (2003–2013) of the Medical Expenditure Panel Survey (MEPS). A secondary aim described expenditure trends in respondents with and without Crohn's disease pre-post FDA approvals of new biologics and the American College of Gastroenterology Crohn's disease treatment guidelines.
Methods: Average annual expenditures (total, prescription, inpatient, and outpatient) were evaluated using a pooled cross-sectional design. Respondent data from the most recent 11 years (2003–2013) of MEPS were analyzed. Two-part generalized linear models with power-link were used to estimate the average annual expenditures per patient adjusted to multiple covariates. Confidence intervals (CI) were estimated using bootstrap methods. Difference-in-differences estimations were performed to compare the changes in health care expenditures pre-post FDA approvals of new biologics and the American College of Gastroenterology Crohn's disease treatment guidelines.
Results: The annual aggregate economic burden of CD was $6.3 billion in the US. Respondents with CD had higher total (+$6442; 95% CI: $4864 to $8297), prescription (+$3283; 95% CI: $2289 to $4445), inpatient (+$1764; 95% CI: $748 to $3551), and outpatient (+$1191; 95% CI: $592 to $2160) expenditures compared to respondents without CD. In the difference-in-differences estimation, respondents with CD had significantly higher total ($P = 0.001$) and prescription ($P < 0.001$) expenditures compared with respondents without CD. Although inpatient and outpatient expenditures were higher in respondents with CD, they were not statistically significant.
Conclusions: Respondents with CD diagnosis had higher expenditures compared to respondents without CD diagnosis from 2003 to 2013. This study captured the most recent availability of new treatment options and changes to treatment guidelines, while providing updated estimates of the economic burden of CD in

* Corresponding author. Pharmaceutical Outcomes Research and Policy Program, University of Washington, 1959 NE Pacific St., HSB H-375, Box 357630 Seattle, WA, 98195-7630, USA.
E-mail address: mbounth@uw.edu (M. Bounthavong).

1551-7411/$ - see front matter
http://dx.doi.org/10.1016/j.sapharm.2016.05.042

the US. However, this research was unable to study the causes of these increased health care expenditures in respondents with CD. Future investigations will need to determine the causal factors for increased expenditures in CD.

Keywords: Crohn's disease; Expenditures; Costs; Biologics; Treatment; Prescription; Inpatient; Outpatient; Medical Expenditure Panel Survey; Economics; Health care

Introduction

Crohn's disease is an inflammatory bowel disease of the gastrointestinal tract characterized by abdominal pain, bleeding, diarrhea, fever, flares, weight loss, and fistulas.[1] Prevalence of Crohn's disease in the United States (US) ranges from 26 to 201 cases per 100,000 population[2,3]; with an incidence rate ranging between 3.1 and 14.6 cases per 100,000 person-years.[2] Medical intervention, which has been effective at inducing and maintaining remission, is the primary treatment option for most patients with Crohn's disease.[1] Despite this, severe forms of the disease may require invasive surgery where resection of the colon (e.g., ileocolectomy and right colectomy) is common.

The economic burden of Crohn's disease has been estimated anywhere between $2.0 to $18.2 billion per year or $11,898 to $23,014 per patient with Crohn's disease (adjusted to 2015 $US).[4–7] However, these estimates were based on claims data and not representative of the US population. Gunnarsson and colleagues remedied this problem by evaluating the pooled Medical Expenditure Panel Survey data from 1996 to 2009, a nationally representative population derived from the National Health Information Survey.[8] They reported that the average annual cost was $10,354 per patient with Crohn's disease, with a US national aggregate annual expenditure of $2.5 billion per year (adjusted to 2015 $US).

Recent advances in pharmaceutical treatments have improved disease management and quality of life in patients with Crohn's disease.[9,10] In 2008, the Food and Drug Administration (FDA) approved two self-injectable biologics (adalimumab and certolizumab pegol) for treatment of moderate to severe Crohn's disease. Recently, in 2012, the FDA approved vedolizumab for a similar indication. Previous estimations of the economic burden of Crohn's disease have not captured the recent FDA approval, which likely impacted health care expenditures for patients with Crohn's disease. Additionally, the American College of Gastroenterology released guidelines in 2009 endorsing the use of self-injectable biologics for the treatment of moderate to severe Crohn's disease.[1] This combination of FDA approvals and prescribing practice changes have contributed to a different landscape of Crohn's disease expenditure in the last few years.[1]

The purpose of this study was to quantify the current economic burden of Crohn's disease using a nationally representative sample from 2003 to 2013 of the US that incorporates the recent FDA approvals and changes in practice endorsed by the American College of Gastroenterology. A secondary objective was to measure the trends in health care expenditure patterns to demonstrate the impact of FDA approvals and practice changes from 2003 to 2013.

Methods

Design

Health care expenditures (total, prescription, inpatient, and outpatient) for Crohn's disease were evaluated using a pooled cross-sectional design based on a representative sample of the noninstitutionalized US population from 2003 to 2013. The pooled dataset provides longitudinal assessment of a nationally representative sample.

Sample

Respondent data based on the most recent 11 years (2003–2013) from the Medical Expenditure Panel Survey (MEPS) were pooled to answer the research objectives.[11] The pooled survey set comes from the subsample of the National Health Interview Survey households and provides a nationally representative sample of the noninstitutionalized US population. The consolidated MEPS Household Component files contain information on health care expenditures, demographics, socioeconomic characteristics, insurance information, employment information, health status, and