Healthcare utilization and costs in women diagnosed with endometriosis before and after diagnosis: a longitudinal analysis of claims databases

Mahesh Fuldeore, Ph.D.,[a] Hongbo Yang, Ph.D.,[b] Ella Xiaoyan Du, M.E.Sc.,[b] Ahmed M. Soliman, Ph.D.,[a] Eric Q. Wu, Ph.D.,[b] and Craig Winkel, M.D.[c]

[a] AbbVie, Inc., North Chicago, Illinois; [b] Analysis Group, Inc., Boston, Massachusetts; and [c] Department of Obstetrics and Gynecology, Georgetown University School of Medicine, Washington, DC

Objective: To assess healthcare resource utilization and costs during the 5 years before and 5 years after diagnosis among women with endometriosis, in comparison with women without endometriosis.
Design: Longitudinal, retrospective, case–control study.
Setting: None.
Patient(s): A total of 37,570 matched pairs of women with and without (controls) endometriosis were identified from the Truven Health MarketScan claims database (2000–2010).
Intervention(s): None.
Main Outcome Measure(s): Annual healthcare resource utilization and costs (in 2010 US dollars) were evaluated for the 5 years before and 5 years after diagnosis.
Result(s): Mean patient age at index (first diagnosis) date was 36.4 years for endometriosis patients and controls. Endometriosis patients had a higher utilization of outpatient and emergency room services during each pre- and postindex year, and a higher utilization of inpatient services during the last preindex year and all 5 postindex years. Total costs were highest in the first postindex year for endometriosis patients, reaching $13,199, compared with $3,747 for controls. Annual costs were significantly higher for patients than controls during each pre- and postindex year; overall, the cost difference was $26,305 over 10 years: $7,028 in the 5 years before diagnosis and $19,277 in the 5 years after diagnosis.
Conclusion(s): Endometriosis poses a significantly high economic burden, both before and after diagnosis. The highest resource utilization and costs experienced by endometriosis patients occur in the first year after diagnosis.
(Fertil Steril® 2015;103:163–71. ©2015 by American Society for Reproductive Medicine.)
Key Words: Endometriosis, costs, healthcare resource utilization, case–control, economic burden

Discuss: You can discuss this article with its authors and with other ASRM members at http://fertstertforum.com/fuldeorem-healthcare-utilization-costs-endometriosis/

Use your smartphone to scan this QR code and connect to the discussion forum for this article now.*

* Download a free QR code scanner by searching for "QR scanner" in your smartphone's app store or app marketplace.

Received July 9, 2014; revised September 13, 2014; accepted October 7, 2014; published online November 15, 2014.
M.F. is an employee of AbbVie and owns stock/stock options. H.Y. is an employee of Analysis Group, Inc., which has received a consulting fee from AbbVie for conducting analyses for this study. E.X.D. is an employee of Analysis Group, Inc., which has received a consulting fee from AbbVie for conducting analyses for this study. E.Q.W. is an employee of Analysis Group, Inc., which has received a consulting fee from AbbVie for conducting analyses for this study. C.W. is a consultant for AbbVie. A.M.S. is an employee of AbbVie and own stock/stock options.
This study was funded by AbbVie, which also develops the endometriosis drug Elagolix (in collaboration with Neurocrine Biosciences).
A synopsis of the present research was presented in poster format at the 16th International Congress on Endocrinology, The Endocrine Society's 96th Annual Meeting and Expo (ICE/ENDO 2014), Chicago, Illinois, June 21–24, 2014.
Reprint requests: Mahesh Fuldeore, Ph.D., AbbVie, Inc., 1 North Waukegan Road, North Chicago, Illinois 60064 (E-mail: Mahesh.fuldeore@abbvie.com).

Fertility and Sterility® Vol. 103, No. 1, January 2015 0015-0282/$36.00

http://dx.doi.org/10.1016/j.fertnstert.2014.10.011

Endometriosis affects more than 5 million women of reproductive age in the United States (1) and 176 million women worldwide (2). Endometriosis is characterized by the presence of endometrium-like tissue outside the uterus and commonly manifests in dysmenorrhea, chronic pelvic pain unrelated to the menstrual cycle, dyspareunia, and subfertility (3, 4). The majority of patients experience symptoms before the diagnosis of

endometriosis (5–8). Because the symptoms are not disease-specific or may not manifest for some time (9–14), surgical confirmation is necessary for the diagnosis (15–17), and there is lack of care for certain patients, endometriosis often remains undiagnosed for a number of years (14, 18). This diagnostic delay, spanning the period from first onset of symptoms to confirmed diagnosis, ranges from 2 to 9 years (12–14, 18–20), with a mean average of 6.7 years reported for women diagnosed surgically across a 10-country, multicenter study (20).

Treatments for endometriosis include pharmacotherapies and surgeries. Existing pharmacologic treatment options focus on managing the clinical symptoms of the disease, such as relieving pain and other symptoms, or suppressing endometriosis implant activity through hormonal manipulation, whereas surgical treatments aim to eliminate current implants and prevent future recurrences (13, 21). Currently there is no pharmacologic treatment approved for long-term chronic use (22, 23), and currently available treatments lack durability of effectiveness after discontinuation of therapy. Endometriosis patients normally use multiple medications in an attempt to control symptoms (24); these medications include pain-relieving medications (nonsteroidal anti-inflammatory drugs and opioids) and hormonal medications intended to control endometriotic implant and lower endometriosis-associated pain, such as combined oral contraceptives, progestins, gonadotropin-releasing hormone (GnRH) agonists, danazol, and the levonorgestrel intrauterine system (15, 16, 18). Patients often experience recurrence of symptoms after discontinuing therapy (22, 23).

Even during treatment, endometriosis can impair patients' physical, mental, and social well-being (25, 26) and may also impose a considerable economic burden on patients and society (13, 20, 24, 27, 28). It is estimated that the annual direct and indirect costs of endometriosis in the United States is $69.4 billion (24). However, the full extent of the economic impact has not been evaluated in prior studies, which have typically covered only the 1 to 2 years after diagnosis (24, 29–32) and likely do not reflect full disease costs. Because endometriosis patients often remain undiagnosed for some time (2–9 years), and given that endometriosis patients may pay an average of seven visits (20) to a general practitioner before referral to a specialist before diagnosis, it is likely that most patients undergo treatment of symptoms without a confirmed diagnosis (33). To understand the true costs of this disease, it is important to assess healthcare utilization and costs incurred by endometriosis patients during prediagnosis years.

In this study we conducted a longitudinal retrospective assessment of healthcare resource utilization and costs among endometriosis patients living in the United States, capturing both pre- and postdiagnosis data, in comparison with a matched cohort of women without endometriosis.

MATERIALS AND METHODS

Data Source

This retrospective claims analysis used data extracted from the Truven Health MarketScan Commercial Claims and Encounters Database Databases (2000–2010), which consists of patient-level data for several million insured individuals. MarketScan is a nationally representative database that covers all the census regions of the United States. MarketScan contains individual-level healthcare claims data, which include information on patient demographics, enrollment history, claims for inpatient and outpatient medical services, and pharmacy claims. Because data are deidentified and in compliance with the confidentiality requirements of the Health Insurance Portability and Accountability Act, no institutional review board approval was required for this study.

Study Design and Sample Selection

Endometriosis patients were selected for the analysis if they were female, diagnosed with endometriosis (International Classification of Diseases [ICD-9] code 617.xx), aged between 18 and 45 years at the time of the first observed endometriosis diagnosis, and had at least 1 year of continuous insurance eligibility before and after the first diagnosis of endometriosis. Controls, who were selected from the general population, had no diagnosis of endometriosis during their entire period recorded in the database. The control patients were matched 1:1 with endometriosis patients by gender, age, region, and insurance type; the control patients were assigned the same index date as their matching endometriosis counterparts. Controls were further required to have at least 1 year of continuous insurance eligibility before and after the index date.

The pre- and postdiagnosis study periods were defined as the 5 years before and the 5 years after the index date, for a total observation period of 10 years. Only patients and matched controls with sufficient continuous eligibility from the index date to the evaluation year were included in the respective analyses. For example, only patients with at least 3 years' continuous eligibility after the index date were included in the analyses for the third year after diagnosis.

Patient Characteristics

Patient characteristics, including age, region, insurance type, and comorbidities (including the Charlson Comorbidity Index [34, 35]), were assessed for both cohorts during the 1-year period before the index date. The occurrence of comorbidities commonly encountered in women with endometriosis, such as uterine fibroids, ovarian cysts, fatigue, depression, infections, and infertility (31, 36–39), was assessed using ICD-9 codes.

Healthcare Resource Utilization and Costs

Annual healthcare resource utilization and costs were calculated for each year during the 10-year observation period. All-cause healthcare resource utilization measures included the proportions of patients with any inpatient (IP) visit, emergency room (ER), and outpatient (OP) visits, the numbers of IP, ER, and OP visits per patient/control (averaged among all patients or controls), and length of stay (LOS) per patient/control for IP visits. All-cause healthcare cost categories included IP costs, ER costs, OP costs, total medical service costs (sum of IP costs, ER costs, and OP costs), prescription