Impact of Switching From an Initial Tumor Necrosis Factor Inhibitor on Health Care Resource Utilization and Costs Among Patients With Rheumatoid Arthritis

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ABSTRACT

Purpose: Despite improved clinical outcomes for the majority of patients, nearly 30% of patients with rheumatoid arthritis (RA) who initiate tumor necrosis factor antagonist (anti-TNF) biologic agents fail to respond to their first-line anti-TNF and switch to another anti-TNF or a non-TNF biologic. How this change affects health care costs and resource utilization is unknown. We therefore compared RA patients taking first-line anti-TNFs who switched to a second anti-TNF versus those patients who switched to an alternate biologic.

Methods: Health care claims data were obtained from a large US database for eligible adults with confirmed RA diagnoses who initiated anti-TNF treatment and switched to another biologic. Health care costs and utilization during the first 12 months' postswitch were compared. Generalized linear models were used to adjust for differences in demographic and clinical characteristics before switching.

Findings: Patients who switched to a second anti-TNF rather than a non-TNF biologic were generally younger (53.0 vs. 55.3 years; $P < 0.0001$) and less likely to be female (79.7% vs. 82.7%; $P = 0.0490$). Of the 3497 eligible patients who switched from first-line anti-TNFs, 2563 (73.3%) switched to another anti-TNF and 934 (26.7%) switched to a non-TNF. Adalimumab was the most frequently prescribed (43.4%) second-line anti-TNF, and abatacept was the most common non–anti-TNF (71.4%). Patients who switched to a second anti-TNF remained on their first medication for a significantly shorter period (342.5 vs 420.6 days; $P < 0.0001$) and had lower comorbidity indices and higher disease severity at baseline than those who switched to a non–anti-TNF. After adjusting for baseline differences, patients who switched to second anti-TNFs versus a non-TNF incurred lower RA-related costs ($20,938.9 vs $22,645.2; $P = 0.0010$) and total health care costs ($34,894.6 vs $38,437.2; $P = 0.0010$) 1 year postswitch. These differences were driven by increased physician office visit costs among the non-TNF group.

Implications: Among the anti-TNF initiators who switched therapy, more patients switched to a second anti-TNF than to a non-TNF. Switching to a second anti-TNF treatment was associated with lower all-cause and RA-related health care costs and resource utilization than switching to a non-TNF. Because switching therapy may be unavoidable, finding a treatment algorithm mitigating this increase to any extent should be considered. These data are limited by their retrospective design. Additional confounding variables that could not be controlled for may affect results. (*Clin Ther*. 2015;37:1454–1465)

Key words: health care costs, health care utilization, rheumatoid arthritis, real-world data analysis.

INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune disorder causing joint pain and swelling that progresses to joint tissue and bone destruction.[1] The prevalence of RA is estimated at 1.5 million adults in the United States, which has significant economic implications for both individual patients and society.[2] Each year, RA is

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responsible for >250,000 hospitalizations and >9 million physician visits in addition to a decrease in life expectancy of 3 to 10 years.[3,4] Moreover, excess health care costs for patients with RA in the United States have been estimated at $8.4 billion annually, with an additional $10.9 billion lost due to functional and work limitations (prices in 2005 US dollars).[5] Appropriate pharmacy and medical policies for the management of patients with RA based on clinical and economic data are imperative for improving patient outcomes while controlling health care costs at the population level.

In the past decade, tumor necrosis factor antagonist (anti-TNF) use has changed the treatment paradigm, with improved clinical outcomes for RA patients with moderate to severe disease.[6] Anti-TNF combination therapy with methotrexate (MTX) has been shown to be a cost benefit, compared with conventional disease-modifying antirheumatic drug therapy, and has demonstrated slowing of radiographic progression.[7] However, nearly 30% of patients with RA fail to respond to their first anti-TNF agent or experience adverse events by 2 years of therapy.[8] Subsequent therapeutic options include switching to another anti-TNF or to a non-TNF biologic agent.

The availability of multiple biologic agents has engendered the question of whether switching to a different TNF inhibitor versus switching to a non-TNF biologic will lead to different clinical and economic outcomes after failure to respond to the initial anti-TNF. Several managed-care medical policies require treatment with at least 2 TNF inhibitors before switching to an alternate biologic agent.[9] These policies are based on the results of controlled clinical trials and observational studies that have shown benefit for a number of patients who failed to respond to initial anti-TNF therapy and who switched to another TNF inhibitor.[10–13] In these studies, patients were more likely to respond to a subsequent anti-TNF agent if previous anti-TNF treatment was discontinued because of adverse reactions.[14,15] Although there are controlled clinical trials evaluating the efficacy and safety of non-TNF biologic agents in patients who have failed to respond to anti-TNF therapy, there are few head-to-head studies that directly compare switching to a second anti-TNF versus switching to a non-TNF biologic agent.[16–18]

A recent study of observational data from the Consortium of Rheumatology Researchers of North America, Inc. (CORRONA) RA registry, which enrolls RA patients from private and academic institutions across the United States, found that clinical outcomes after a switch from one TNF inhibitor to a second TNF inhibitor were similar to those observed when switching to abatacept (ABA).[19] Although this study evaluated clinical outcomes in an observational setting, an economic evaluation was not conducted. The latter is an important issue because the cost-effectiveness associated with switching to a second-line biologic agent is poorly defined, although studies have shown that, after a switch in treatment, patients incur higher costs compared with those who do not switch.[20,21] It is possible that both clinical and economic evaluation of biologic switching may guide policy development to ensure this disabling disease is controlled at the population level while managing overall health care costs.

The objective of the present study, therefore, was to evaluate the impact on health care costs and resource utilization of switching from a first-line anti-TNF therapy to a second biologic agent. We also examined whether there was a differential impact on cost and resource utilization associated with switching to a second anti-TNF agent compared with switching to a non-TNF antagonist.

PATIENTS AND METHODS

Data Source

The Truven Health MarketScan Commercial Claims and Encounters Database and the Medicare Supplemental and Coordination of Benefits database from January 2004 through December 2010 were used in this retrospective study. These databases capture the full continuum of care in all settings, including physician office visits, inpatient stay, emergency department (ED) visits, and retail, mail order, and specialty pharmacy claims, as well as patient demographic and enrollment information.

Study Sample

Adult patients at least 18 years of age with at least 2 physician-confirmed diagnoses of RA (*International Classification of Diseases, Ninth Revision, Clinical Modification*, code: 714.0X) at least 2 months apart during the identification period (January 2005–December 2009) were selected.[22] Patients were required to have an initial prescription claim for an anti-TNF biologic (etanercept [ETN], adalimumab [ADA], or infliximab [IFX]) after RA diagnosis and a subsequent switch to another anti-TNF (ETN, ADA, IFX, golimumab, or certolizumab) or non-TNF biologic (ABA, anakinra [ANK], or rituximab). Tocilizumab,