Economic Impact of Oritavancin for the Treatment of Acute Bacterial Skin and Skin Structure Infections in the Emergency Department or Observation Setting: Cost Savings Associated with Avoidable Hospitalizations

Thomas P. Lodise, PharmD, PhD[1]; Weihong Fan, MS[2]; and Katherine A. Sulham, MPH[2]

[1]Albany College of Pharmacy and Health Sciences, Albany, New York; and [2]The Medicines Company, Parsippany, New Jersey

ABSTRACT

Purpose: Data indicate that acute bacterial skin and skin structure infection (ABSSSI) patients without major comorbidities can be managed effectively in the outpatient setting. Because most patients with ABSSSIs present to the emergency department, it is essential that clinicians identify candidates for outpatient treatment given the substantially higher costs associated with inpatient care. We examined the potential cost avoidance associated with shifting care from inpatient treatment with vancomycin to outpatient treatment with oritavancin for ABSSSI patients without major complications or comorbidities.

Methods: A decision analytic, cost-minimization model was developed to compare costs of inpatient vancomycin versus outpatient oritavancin treatment of ABSSSI patients with few or no comorbidities (Charlson Comorbidity Index score ≤ 1) and no life-threatening conditions presenting to emergency department. Hospital discharge data from the Premier Research Database was used to determine the costs associated with inpatient vancomycin treatment.

Findings: Mean costs for inpatient treatment with vancomycin ranged from $5973 to $9885, depending on Charlson Comorbidity Index score and presence of systemic symptoms. Switching an individual patient from inpatient vancomycin treatment to outpatient oritavancin treatment was estimated to save $1752.46 to $6475.87 per patient, depending on Charlson Comorbidity Index score, presence of systemic symptoms, and use of observation status. Assuming some patients may be admitted to the hospital after treatment with oritavancin, it is estimated that up to 38.12% of patients could be admitted while maintaining budget neutrality.

Implications: This cost-minimization model indicates that use of oritavancin in the emergency department or observation setting is associated with substantial cost savings compared with inpatient treatment with vancomycin. (*Clin Ther*. 2015;▮:▮▮▮–▮▮▮) © 2015 Elsevier HS Journals, Inc. All rights reserved.

Key words: Acute Bacterial Skin and Skin Structure, Infections, ABSSSI, oritavancin vancomycin cost impact.

INTRODUCTION

Acute bacterial skin and skin structure infections (ABSSSIs) are among the most common infections observed in the emergency department (ED).[1,2] Although patients with ABSSSIs have historically received care in the hospital, which often includes multiday regimens of intravenous antibiotics, data suggest that many of these patients can be managed effectively in the outpatient setting.[3–5] Because most patients with ABSSSIs present to the ED, clinicians in the ED essentially serve as "gatekeepers" to hospital admission. This is a critical role in health care systems, given that mean hospitalization costs of patients with ABSSSI typically range from $6000 to $13,000 per patient (mean cost $8000 per patient), with multiday room and board expenses comprising 50% of total costs.[6,7] Because inpatient care for ABSSSI costs approximately 2 to 4 times more than outpatient care,[8] it is essential that ED clinicians identify candidates for outpatient parenteral antimicrobial treatment and utilize patient care strategies that can

Accepted for publication November 18, 2015.
http://dx.doi.org/10.1016/j.clinthera.2015.11.014
0149-2918/$ - see front matter

effectively shift site of care from the inpatient to the outpatient setting to reduce the overall cost of ABSSSI treatment. Any agent used in an effort to reduce the health care burden associated with inpatient treatment of patients with ABSSSIs must have reliable activity and efficacy against methicillin-resistant *Staphylococcus aureus*, given the high prevalence of this pathogen among these patients.[2]

Although no standard clinical criteria exist for outpatient parenteral antimicrobial treatment eligibility for patients with ABSSSIs, several expert panels suggest hospital admissions should be limited to patients with unstable comorbidities or those with more severe infections.[9–11] Despite this recommendation, many of these patients continue to be treated in the inpatient setting. Cognizant of this, the present study examined the potential cost avoidance of shifting care from the inpatient to outpatient setting for patients without major complications or comorbidities, facilitated by use of oritavancin. Oritavancin is a recently approved single-dose intravenous therapy for the treatment of ABSSSI caused or suspected to be caused by certain gram-positive pathogens, including methicillin-resistant *S aureus*.[12]

We hypothesized that outpatient use of oritavancin in patients with few or no comorbidities and no life-threatening conditions would be associated with lower costs than inpatient treatment of these patients with vancomycin, the most common standard of care treatment used in this patient population.[13–15] To explore this hypothesis, a cost-minimization model was developed from the hospital perspective to estimate the potential cost savings associated with treating adult ABSSSI patients with no or limited comorbidities and no life-threatening conditions with oritavancin in the outpatient setting relative to managing patients in the hospital with intravenous vancomycin. As part of the analysis, we also estimated the threshold for the proportion of patients initially receiving oritavancin in the outpatient setting that could be subsequently admitted while still conferring cost savings associated with oritavancin use relative to inpatient vancomycin therapy.

MATERIALS AND METHODS

Model Structure and Population

A decision analytic, cost-minimization model was developed to compare the costs of inpatient vancomycin versus outpatient oritavancin for the treatment of ABSSSI patients with few or no comorbidities (Charlson Comorbidity Index [CCI] score of 0 or 1) presenting to the ED (Figure 1). Patients with life-threatening conditions were excluded from the analysis, as they would not be considered appropriate for outpatient treatment with oritavancin. Conditions considered life-threatening included necrotizing fasciitis or limb-threatening infections due to vascular compromise, bacteremia, neutropenia, sepsis and systemic inflammatory response syndrome. All vancomycin patients were assumed to be admitted as inpatients. For patients treated with oritavancin, it is anticipated that the intent is to treat patients as outpatients, either administering oritavancin in the ED and discharging directly, or administering oritavancin and observing the patient in a dedicated observation unit or under observation status. It is conservatively assumed, however, that some oritavancin-treated patients may be subsequently admitted to the hospital for factors such as worsening infection or hypersensitivity reaction. The impact of the rate of this potential subsequent hospitalization is explored in detail in this analysis. For hospitalized patients, 4 categories of disease severity were explored: CCI of 0 with and without systemic symptoms and CCI of 1 with and without systemic symptoms. Hypotension, mental status change, tachycardia, tachypnea, acute kidney failure, renal failure, fever, or abnormal glucose were considered systemic symptoms.

As studies have reported no significant difference in treatment failure or rehospitalization rates between vancomycin and oritavancin, those parameters were excluded from the model.[16–18] We focused the model structure on patient severity and site of care.

Model Inputs

Costs Associated with Vancomycin Use

To determine the costs associated with hospital inpatient treatment of ABSSSI patients receiving intravenous vancomycin, a retrospective, observational study was conducted using hospital discharge data from the Premier Research Database. The Premier Research Database contains clinical and economic data from >600 hospitals, representing all geographic regions within the United States over a broad range of health care facility sizes and architectures (ie, academic and nonacademic hospitals), located in both urban and rural settings. More than 5 million inpatient discharges and 35 million outpatient visits are recorded annually.