

Telavancin Versus Standard Therapy for Treatment of Complicated Skin and Soft-Tissue Infections Due to Gram-Positive Bacteria

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Background. Telavancin, a novel lipoglycopeptide, exerts concentration-dependent, rapid bactericidal activity on account of its multiple mechanisms of action. Telavancin is highly active against gram-positive bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-intermediate, and vancomycin-resistant strains.

Methods. We conducted a randomized, double-blind, controlled, phase-2 clinical trial. Patients ≥ 18 years of age with a diagnosis of complicated skin and soft-tissue infection caused by suspected or confirmed gram-positive organisms were randomized to receive either intravenously administered telavancin once daily or standard therapy (antistaphylococcal penicillin 4 times daily or vancomycin twice daily).

Results. For the study, 167 patients were randomized and received at least 1 dose of study medication. Success rates were similar in all analysis populations at the test-of-cure evaluation. Of patients with *S. aureus* infection at baseline ($n = 102$), 80% of the telavancin group were cured and 77% of the standard therapy group were cured. For patients with MRSA infection at baseline ($n = 48$), cure rates were 82% for the telavancin group and 69% for the standard therapy group. Microbiologic eradication in patients with MRSA infection was 84% for the telavancin group versus 74% for the standard therapy group. MIC₉₀ values were lower for telavancin in all tested strains of *S. aureus* (≤ 0.25 ug/mL) compared with the MIC₉₀ values for vancomycin and oxacillin. Similar proportions of patients discontinued therapy for adverse events in both treatment groups ($\sim 5\%$). Fewer serious adverse events were reported in the telavancin group (4 events) than were for the standard therapy group (9).

Conclusion. Clinical and microbiological results of this study support the further development of telavancin, especially for treatment of infection due to MRSA.

The incidence of infection caused by methicillin-resistant-*Staphylococcus aureus* (MRSA) is increasing worldwide [1–3]. In the United States, $>50\%$ of the isolates of *S. aureus* from intensive care units are resistant to methicillin [4]. These dramatic rates of resistance are also accompanied by rising rates of MRSA infection [1, 5–11] among community-dwelling persons with no identifiable risk factors for infections with this invasive pathogen. In view of these epidemiological changes, new bactericidal agents are urgently needed to treat

severe infection caused by MRSA. Despite this documented need, the development of antimicrobials is declining, as has been recently described by Spellberg et al. [12].

Telavancin, a novel lipoglycopeptide, is a rapidly acting bactericidal antibiotic and is highly active against gram-positive bacteria, including strains of MRSA, vancomycin-intermediate *S. aureus* (VISA), and vancomycin-resistant *S. aureus* (VRSA) [13–15]. Unlike other glycopeptides, telavancin has concentration-dependent bactericidal effects and multiple mechanisms of action. Telavancin inhibits transglycosylase activity, leading to the inhibition of cell-wall synthesis, and also interacts with the bacterial membrane, dissipating the membrane potential and effecting changes in cell permeability that correlate with loss in bacterial cell viability [16]. The plasma elimination half-life of telavancin in subjects

Received 4 November 2004; accepted 25 January 2005; electronically published 28 April 2005.

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Clinical Infectious Diseases 2005;40:1601–7

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1058-4838/2005/4011-0005\$15.00

with normal renal function is 7–9 h; and the drug produces a prolonged postantibiotic effect (4–6 h) [13, 17]. Telavancin can be administered intravenously once per day, and it is primarily eliminated unchanged in the urine [17].

Preclinical experience indicates that telavancin has a more potent bactericidal effect against *S. aureus*, including MRSA, in both in vitro and animal models, than do other antimicrobials, including β -lactams, linezolid, and vancomycin [18]. These findings extend to other resistant gram-positive cocci, such as penicillin-resistant pneumococci, other streptococci, and methicillin-resistant coagulase-negative staphylococci. We undertook what is, to our knowledge, the first clinical trial of telavancin for treatment of patients with gram-positive bacterial infection.

PATIENTS AND METHODS

The study was a randomized, double-blind, active-controlled, parallel group, phase 2 clinical trial, conducted at 14 centers in the United States and 7 centers in South Africa. All centers received approval from their institutional review boards, and informed consent was obtained from all patients prior to participation in the study.

Randomization was made with an interactive voice-response system that utilized a permuted block algorithm and stratified patients according to standard therapy chosen (an antistaphylococcal penicillin or vancomycin) and geographic region (United States or South Africa).

Patient population. Patients were considered eligible for the study if they were men or nonpregnant women ≥ 18 years of age with a diagnosis of complicated skin and soft-tissue infection (SSTI) caused by a suspected or confirmed gram-positive organism. To be considered evaluable, patients must have received at least 4 days of study therapy. Complicated SSTI was defined by the presence of a major abscess requiring surgical drainage, an infected burn, deep extensive cellulitis, or an infected wound or ulcer. In addition, patients were required to have a purulent drainage fluid or collection specimen or at least 3 of the following: erythema, fluctuance, heat and/or localized warmth, pain and/or tenderness to palpation, swelling and/or induration, fever (defined as a temperature of $>38^{\circ}\text{C}$), a WBC count of $>10,000$ cells/ mm^3 , or a differential WBC count with $>15\%$ bands.

Patients were excluded if they had received antibiotic therapy for >24 h within 7 days prior to enrollment (unless the pathogen was resistant or there were clinical signs of failure of therapy), had osteomyelitis, gangrene, necrotizing fasciitis, burns involving $>20\%$ of the body surface, chronic diabetic foot ulcers, or mediastinitis. Patients were also excluded if they had uncomplicated SSTI, a creatinine clearance of <50 mL/min, moderate-to-severe liver disease (Child-Pugh class B or C), alanine transaminase or aspartate transaminase levels >5

times the upper normal limit, ANC <500 cells/ mm^3 , HIV infection with a CD4 count of <100 cells/ mm^3 , or a Fridericia-corrected QT interval of >470 ms.

Antimicrobial therapy. Patients were randomized at a ratio of 1:1 to receive either intravenous telavancin (7.5 mg/kg once per day) or intravenous standard therapy (1 g of vancomycin every 12 h, 2 g of nafcillin or oxacillin every 6 h, or 0.5–1 g of cloxacillin every 6 h). Standard therapy was selected by the investigator prior to randomization. For the standard therapy group, adjustment of the dosage was permitted (including adjustment of vancomycin dosage via monitoring of the serum level), according to the standard practice of the individual participating site, inasmuch as site personnel involved in evaluating clinical response remained blinded to the treatment assignments.

Also, after results of culture and susceptibility testing were available, a change of standard therapy was allowed. For example, patients infected with methicillin-susceptible *S. aureus* who were randomized to the vancomycin group and had recovered since baseline cultures were performed could be switched to treatment with an antistaphylococcal penicillin. An unblinded individual (usually a pharmacist) at the investigative site who did not participate in patient evaluation performed the adjustment of the standard therapy dosage and prepared the study medications. Patients received the study medication for at least 4 days, with a maximum treatment period of 14 days. Dummy infusions were used to maintain blinding. A switch to oral therapy was not permitted. For patients with proven or suspected polymicrobial infections, aztreonam and/or metronidazole were allowed for concomitant antibacterial therapy.

Clinical and microbiological evaluations. Clinical assessments were performed at baseline and daily until the end of therapy. The end-of-therapy evaluation was conducted within 3 days after the last dose of study medication was administered, and the test-of-cure evaluation was scheduled 7–14 days after the last dose of study medication. At each evaluation, investigators documented the extent of the infection, significant medical conditions, surgical procedures, concomitant medications, and adverse events, and also obtained electrocardiograms and results of prespecified laboratory studies.

Specimens for gram stains and culture were obtained from all patients at baseline and again at the end-of-therapy evaluation and/or at the test-of-cure evaluation, if drainage or significant lesions were present. Needle aspiration was performed on patients with cellulitis. In patients with deeper infection, specimens were collected by needle aspiration or surgical procedures. Culture, organism identification, and susceptibility testing were performed at each site. Isolates were also sent to a central laboratory (ICON Laboratories; Farmingdale, NY) for

confirmatory testing, including susceptibility testing against telavancin.

Statistical analysis. The objectives of the FAST study were to assess the safety of telavancin and to explore the efficacy of the drug in patients with complicated skin and soft-tissue infections. Sample size was determined on the basis of clinical judgment and was deemed adequate to provide clinically meaningful descriptive results that were consistent with the study objectives. All *P* values and confidence intervals were 2-sided, and a *P* value of .05 was considered statistically significant.

Analysis populations. Three subject populations were defined for analysis. (1) The “all-treated population” comprised all patients with a confirmed diagnosis of complicated SSTI who received at least 1 dose of study medication. (2) The “clinically evaluable population” comprised patients in the all-treated population who met all exclusion and inclusion criteria, received at least 4 days of study medication, and had a clinical response of either “cure” or “failure” at the test-of-cure visit. (3) The “microbiologically evaluable population” comprised patients in the clinically evaluable population who also had a baseline gram-positive pathogen recovered from pretreatment cultures at baseline.

Safety. The safety of telavancin was evaluated in patients who received ≥ 1 dose of the study medication. Data on adverse events and vital signs and findings from electrocardiograms and laboratory tests were collected. Adverse events and their relationship to the receipt of the study medication were judged and classified by the investigators. Electrocardiograms were recorded and analyzed at a core laboratory (eResearch Technology; Philadelphia, PA).

Responses. Clinical response was documented as “cure,” “failure,” or “indeterminate” at the end-of-therapy and test-of-cure evaluations. “Cure” was defined as resolution of clinically significant signs and symptoms associated with the skin and soft-tissue infection present at study admission or improvement to the extent that the infectious process had been controlled and required no further antimicrobial therapy. “Failure” was defined as inadequate response to study therapy or the need for significant surgical management (e.g., more than routine debridement) of the infection site after antibiotic therapy and prior to the test-of-cure evaluation. “Indeterminate” was defined as an outcome that could not be determined. A blinded clinical event committee reviewed and adjudicated the derived clinical response for all patients in the following categories: indeterminate, failure, enrollment under protocol exception, and those experiencing a serious adverse event.

After the database was locked and investigators were unblinded, it was discovered that 2 patients (both in the telavancin group) had been assigned an incorrect clinical response. Both cases were deemed to have indeterminate outcomes and were reclassified as such before final analyses were performed.

In the microbiologically evaluable population, the baseline pathogen was considered “eradicated” at the end-of-therapy evaluation or the test-of-cure evaluation if the pathogen was not detected by culture or if the subject’s clinical response was a “cure” and there was nothing available for culture.

RESULTS

Study population. For the study, 167 patients (84 in the telavancin group and 83 in the standard therapy group) were randomized and received at least 1 dose of study medication. In the standard therapy group, 76% of patients received definite treatment with vancomycin and 24% received antistaphylococcal β -lactams. There were no patients in the standard therapy group who required a switch from a β -lactams to vancomycin for treatment of MRSA infection.

Baseline patient characteristics were similar for both groups (table 1). More than half of the patients were male (60%) and white (64%). The average age was 44 years. The most common diagnoses were major abscesses (in 48% of patients), followed by deep and/or extensive cellulitis (37%) and wound infections (12%). Infections occurred most frequently in the lower extremities (in 45% of patients), torso (24%), and upper extremities (23%). Common predisposing factors included recent surgical procedures (for 35% of patients), diabetes (26%), and trauma (20%). Approximately 80% of patients in the telavancin group and 66% of patients in the standard therapy group had received prior treatment with antimicrobials.

Baseline pathogens and in vitro susceptibilities. At least 1 baseline pathogen was identified in 81% of the all-treated population; a single pathogen was isolated in 75% of the all-treated population. Mixed infection (defined as isolation of ≥ 2 pathogens) was documented in 20% of patients (17 patients in each arm of the study). The most commonly isolated pathogens were *S. aureus* (53%), gram-negative bacteria (22%), and nonenterococcal streptococci (12%). MIC₉₀ values for telavancin, oxacillin, and vancomycin were determined for 37 strains of methicillin-susceptible *S. aureus* (MSSA) and 35 strains of MRSA. The MIC₉₀ for telavancin was 0.25 $\mu\text{g}/\text{mL}$ for both MSSA (range, 0.03–0.25 $\mu\text{g}/\text{mL}$) and MRSA (range, 0.06–0.25 $\mu\text{g}/\text{mL}$). All tested strains of *S. aureus* that were obtained from patients in the study were susceptible to ≤ 0.25 $\mu\text{g}/\text{mL}$ of telavancin. Serum levels of telavancin were determined for 48 patients. The mean peak and trough concentrations (\pm SD) were 66 ± 12 $\mu\text{g}/\text{mL}$ and 4 ± 0.8 $\mu\text{g}/\text{mL}$, respectively. In vitro susceptibilities of the baseline gram-positive pathogens are presented in table 2.

Clinical response. The median duration of treatment with study medication was 7 days in both groups. Cure rates were similar in all populations at both the end-of-therapy evaluation and the test-of-cure evaluation (table 3). For the all-treated population (*n* = 167), at the test-of-cure evaluation, cure had

Table 1. Patient populations and baseline characteristics in a study of telavancin for treatment of gram-positive bacterial infection.

Variable	Treatment group	
	Telavancin	Standard therapy
Study population		
Randomized	84 (100)	85 (100)
All-treated	84 (100)	83 (98)
Clinically evaluable	72 (86)	69 (81)
Microbiologically evaluable	56 (67)	56 (66)
Characteristics of the all-treated population		
Age in years, mean \pm SD	44.6 \pm 13.9	44.3 \pm 13.5
Male sex	54 (64)	46 (55)
White race	51 (61)	55 (66)
Predisposing conditions		
Prior surgery	29 (35)	30 (36)
Diabetes	25 (30)	19 (23)
Trauma	17 (20)	17 (21)
Skin diseases	4 (5)	2 (2)
Most common types of infection		
Abscess	39 (46)	41 (50)
Cellulitis	29 (35)	32 (39)
Wound infection	11 (13)	8 (10)
Allowed concomitant antibacterial therapy ^a		
Aztreonam	29 (35)	24 (28)
Metronidazole	20 (24)	21 (25)

NOTE. Data are no. (%) of patients, unless otherwise indicated.

^a Among patients in the all-treated population who received ≥ 1 dose of aztreonam or metronidazole.

been achieved in 66 patients (79%) in the telavancin group and 66 patients (80%) in the standard therapy group (Barnard test, $P = .53$; 95% CI, $-0.13, 0.05$). In the clinically evaluable population, 66 patients (92%) in the telavancin group and 66 patients (96%) in the standard therapy group ($P = .53$; 95% CI, $-0.13, 0.05$) were cured at the test-of-cure evaluation. In the microbiologically evaluable population ($n = 112$), at the test-of-cure evaluation, cure had been achieved in 52 patients (93%) in the telavancin group and 53 patients (95%) in the standard

therapy group ($P = .79$; 95% CI, $-0.13, 0.09$). In the microbiologically evaluable population (i.e., those infected with coagulase-negative staphylococci, viridans streptococci, or *Bacillus* sp.), excluding patients with isolation of organisms that likely represented contamination, cure was achieved in 48 patients (92%) in the telavancin group and 48 patients (94%) in the standard therapy group.

S. aureus was isolated at baseline from 50 patients in the telavancin group and from 52 patients in the standard therapy

Table 2. Most common gram-positive pathogens isolated at baseline and MIC₉₀ values for different antibacterial agents.

Pathogen	No. of isolates tested	MIC ₉₀ (range), in $\mu\text{g/mL}$, by agent		
		Telavancin	Oxacillin	Vancomycin
Staphylococci				
All	82	0.25 (0.03–0.25)	≥ 8 (0.12 to ≥ 8)	1 (0.25–2)
MSSA	37	0.25 (0.03–0.25)	0.5 (0.06 to 2)	1 (0.25–1)
MRSA	35	0.25 (0.06–0.25)	≥ 8 (4 to ≥ 8)	1 (0.5–1)
CONS	10	0.12 (0.06–0.25)	≥ 8 (0.12 to ≥ 8)	1 (1–2)
Streptococci	11	0.06 (0.03–0.12)	0.03 (0.06 to 0.5)	0.25 (0.25–0.5)

NOTE. MSSA, methicillin-susceptible *Staphylococcus aureus*; MRSA, methicillin-resistant *S. aureus*; CONS, coagulase-negative *S. aureus*.

Table 3. Clinical response at the test-of-cure visit in a study of telavancin for treatment of gram-positive bacterial infection.

Population, response	No. (%) of patients, by treatment group		P ^b	95% CI ^c
	Telavancin ^a	Standard therapy ^a		
All-treated				
Achieved cure	66/84 (79)	66/83 (80)	.53	-0.13, 0.05
Had treatment failure	6/84 (7)	3/83 (4)
Indeterminate	12/84 (14)	14/83 (17)
Infected with <i>Staphylococcus aureus</i> , achieved cure	40/50 (80)	40/52 (77)	.80	-0.16, 0.11
Infected with MRSA, achieved cure	18/22 (82)	18/26 (69)	1.00	-0.21, 0.21
Clinically evaluable, achieved cure	66/72 (92)	66/69 (96)	.53	-0.13, 0.05
Microbiologically evaluable population, achieved cure	52/56 (93)	53/56 (95)	.79	-0.13, 0.09

NOTE. MRSA, methicillin-resistant *S. aureus*. All percentages are calculated relative to the number of nonmissing observations.

^a Sum of percentages may equal more than 100 because of rounding.

^b P values were determined by Barnard's unconditional test of superiority. Values of Indeterminate were excluded from the calculations.

^c 95% CI for the difference between clinical responses to Telavancin and Standard Therapy in the proportion of patients who achieved cure. Values of Indeterminate were excluded from the calculations.

group. In these patients, cure was achieved at the test-of-cure evaluation in 40 patients (80%) in the telavancin group and 40 patients (77%) in the standard therapy group. In patients with MRSA at baseline ($n = 48$), cure was achieved in 82% of the telavancin group and in 69% of the standard therapy group.

Microbiological response. In the all-treated population, 112 patients (67%) were microbiologically evaluable. Among these 112 patients, baseline pathogens were considered eradicated at the end-of-therapy evaluation in 42 patients (75%) in both the telavancin and standard therapy groups ($P = .89$; 95% CI, -0.15, 0.17). At the test-of-cure evaluation, eradication was achieved in 44 patients (80%) in the telavancin group and in 46 patients (82%) in the standard therapy group ($P = .83$; 95% CI, -0.17, 0.13). Among patients infected with MRSA, however, eradication was successful at the test-of-cure evaluation in 16 patients (84%) in the telavancin group compared with 14 patients (74%) in the standard therapy group (not statistically significant). Table 4 displays the microbiological responses.

Safety and tolerability. Overall, adverse events were reported in 56% of patients in the telavancin group and in 60% of patients in the standard therapy group. Adverse events were considered possibly/probably related to therapy for 32% of patients in the telavancin group and 29% of patients in the standard therapy group. Fewer patients in the telavancin group experienced severe adverse events (4% of the telavancin group vs. 7% of the standard therapy group). Similar proportions of patients discontinued therapy because of an adverse event in both groups (6% of the telavancin group and 5% of the standard therapy group). Serious adverse events were reported in 4 patients in the telavancin group and in 9 patients of the standard therapy group.

Table 5 displays the incidence of the most common adverse

events reported in the 2 groups. The incidences of most individual adverse events were similar between the 2 groups. Three patients in the vancomycin group experienced red man syndrome, compared with none in the telavancin group. Vomiting, paresthesias, and dyspnea were reported more frequent among patients in the telavancin group. Most of these episodes were mild and were deemed unrelated to the study medication. Dyspnea was generally associated with other symptoms of asthma or respiratory infections.

Table 6 displays the incidence of laboratory abnormalities in the 2 groups. Laboratory abnormalities included elevated serum creatinine values at the end-of-treatment evaluation in 7 patients in the telavancin group and in 2 patients in the standard therapy group. At the test-of-cure visit, 5 patients in the telavancin group and 4 in the standard therapy group were doc-

Table 4. Microbiological response in a study of telavancin for treatment of gram-positive bacterial infection.

Microbiological eradication	Proportion (%) of patients, by treatment group		P ^b
	Telavancin ^a	Standard therapy ^a	
At the EOT evaluation			
MRSA	12/19 (63)	11/19 (58)	.59
Total	42/56 (75)	42/56 (75)	.89
At the TOC evaluation			
MRSA	16/19 (84)	14/19 (74)	.53
Total	44/56 (80)	46/56 (82)	.83

NOTE. TOC, test of cure; MRSA, methicillin-resistant *Staphylococcus aureus*; EOT, end of therapy.

^a Percentages computed including "indeterminate" responses.

^b From Barnard's unconditional test of superiority. Values of "indeterminate" are excluded from the calculations.

Table 5. Adverse events reported in $\geq 5\%$ of patients in any group within the all-treated population.

Adverse event	No. (%) of patients with adverse event associated with therapy, by treatment group	
	Telavancin (n = 84)	Standard therapy (n = 83)
Nausea	13 (15)	11 (13)
Psychiatric disorder	10 (12)	8 (10)
Headache	9 (11)	8 (10)
Vomiting	8 (10)	3 (4)
Dyspnea	7 (8)	1 (1)
Paresthesia	4 (5)	0
Constipation	3 (4)	5 (6)
Total	47 (56)	50 (60)

umented as having higher creatinine values, compared with those obtained at baseline. The maximum creatinine values were 2.3 mg/dL in the telavancin group, which occurred in 2 patients, and 2.5 mg/dL in the standard therapy group, which occurred in 1 patient. The remainder of the abnormal values ranged from 1.2 mg/dL to 1.8 mg/dL. The increases in serum creatinine levels were documented as being reversible and did not lead to treatment discontinuation. Factors other than the study medication received (e.g., dehydration and hypotension) may have contributed to these abnormalities. Microalbuminuria was found more commonly in patients in the telavancin group but was not associated with abnormal serum creatinine levels. Mild decreases in platelet counts were found at the end-of-therapy visit in 6 patients in the telavancin group; the lowest platelet count was 107,000 platelets/mm³ (normal range, 150,000–440,000 cells/mm³). Mean values (\pm SD) for those patients who experienced decreased platelet counts were 296,000 \pm 111,000 platelets/mm³ at baseline and 176,000 \pm 101,000 platelets/mm³ at the end-of-therapy visit, respectively. These abnormalities had resolved by the follow-up visit in all but 1 patient, who had systemic scleroderma and was receiving intravenous prostaglandins. An analysis of electrocardiogram data revealed that the mean Fridericia-corrected QT interval, compared with that measured at baseline, was 6.4 ms longer for the telavancin group than for the standard therapy group.

DISCUSSION

This is the first study, to our knowledge, to explore the safety and efficacy of telavancin therapy in patients with complicated skin and soft-tissue infections. Notably, MRSA accounted for $\sim 50\%$ of the isolates of *S. aureus*, which was by far the most common pathogen that we isolated. Telavancin was found to be as effective as standard therapy for all study populations. In patients infected with *S. aureus*, including those infected with

MRSA, the clinical response rates at the test-of-cure visit were higher in the telavancin group (although this was not statistically significant). The peak and trough serum levels of telavancin achieved in this study were 264 and 16 times greater than the MIC₉₀ values, respectively, for both MSSA and MRSA strains. These findings are in agreement with preclinical studies showing that telavancin has a more potent bactericidal effect against MSSA and MRSA than do β -lactams, linezolid, and vancomycin [13, 18]. For example, in the neutropenic-mouse thigh model, telavancin was found to be 4 times more potent than vancomycin against MRSA and 43 times more potent than nafcillin against MSSA [18]. This higher potency against both MSSA and MRSA was also documented with immunocompetent animal models (e.g., a subcutaneous-abscess mouse model) [18].

Serious and severe adverse events were less frequent in the telavancin group. Mild and transient decreases in platelet counts were observed in a small proportion of patients in the telavancin group. Importantly, no bleeding events were documented. Serum levels of creatinine were increased in a small proportion of patients in both groups at the end-of-treatment evaluation and at the test-of-cure evaluation. These increases in serum levels of creatinine were uniformly mild and reversible. A small prolongation in the Fridericia-corrected QT interval was observed in the telavancin group, compared with that of the standard therapy group. The prolongation (change in the mean value from baseline) is similar to that encountered with other commonly used antibiotics, such as levofloxacin [19], and the 6.4 ms difference in prolongation between telavancin and standard therapy was consistent with the ~ 4 ms difference in prolongation between telavancin and placebo groups that was documented in a large, definitive phase 1 study [20]. No cardiovascular adverse events or arrhythmia associated with Fridericia-corrected QT interval prolongation were documented.

A limitation of this study is the sample size. This study was

Table 6. Laboratory abnormalities reported in the all-treated population, at the end-of-therapy evaluation.

Abnormality ^a	No. (%) of patients with abnormalities, by treatment group	
	Telavancin (n = 84)	Standard therapy (n = 83)
Increased AST and/or ALT value(s) ^a	13 (16)	15 (18)
Anemia	8 (10)	8 (10)
Increased serum of creatinine level ^a	7 (8)	2 (2)
Decreased platelet count ^a	6 (7)	0
Microalbuminuria	6 (7)	1 (1)
Leukopenia	1 (1)	2 (2)

NOTE. AST, aspartate aminotransferase; ALT, alanine aminotransferase.
^a Relative to baseline value.

conducted to provide preliminary data on the safety and efficacy of telavancin and was not powered to provide statistically significant results. Importantly, a large number of patients (102) in the all-treated population had *S. aureus* isolated at baseline, the target pathogen, and ~50% of the *S. aureus* isolates were MRSA strains.

The incidence of infection produced by MRSA [1–4], including community-acquired cases [5–11], is rising worldwide. New antibacterial agents are urgently needed to treat the increasing number of patients infected with drug-resistant strains of *S. aureus*. The clinical and microbiological results of this study support further investigations involving telavancin in the treatment of serious infections due to gram-positive pathogens, particularly MRSA.

Acknowledgments

This study was supported by and conducted under the auspices of Theravance and was coordinated by the Duke Clinical Research Institute, Durham, NC. We give special thanks to Joanne Miller at Theravance, who provided invaluable clinical research management support.

Financial support. Theravance.

Potential conflicts of interest. E.S., S.L.B., and M.M.K. are employees of Theravance. W.D.O., W.K.L., F.D.P., L.M.D., and V.G.F. Jr. are investigators for Theravance. V.G.F. Jr. has also received research funding from Theravance, Nabi, Inhibitex, Cubist, and the National Institutes of Health; he is a consultant for Inhibitex, Merck, and Cubist; and he is on the speakers' bureaus for Cubist and Pfizer. M.E.S. has received a research grant from Theravance and is currently a consultant for Theravance; his consulting services started after this study was closed and this manuscript was written. G.R.C. has received research funding from Theravance, Cubist, and Inhibitex; is a consultant for Cubist and Inhibitex; and is a principal investigator for Theravance. V.H.C. received a research grant from Theravance. C.H.C. and M.V.: no conflicts.

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