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Efficacy of Tedizolid Phosphate in Treating Mastitis: A Clinical Outcome Analysis

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Abstract **Original Research Article**

Background: Mastitis is a common inflammatory condition of the breast, often requiring effective antibiotic treatment. This study evaluates the efficacy of tedizolid phosphate in treating mastitis among patients in an outpatient setting. ***Methods:*** A total of 100 patients diagnosed with mastitis at the OPD of Prime Hospital, Maijdee, Noakhali, were enrolled in this study between July 1, 2023, and June 30, 2024. Patients received tedizolid phosphate, and outcomes were assessed through clinical examination and follow-up. The study focused on symptom resolution, duration of antibiotic course, and adjunctive treatments. ***Result:*** The majority of patients (45.0%) were aged 21-30 years. The most common symptoms were breast pain (60.0%), breast lump (40.0%), and nipple discharge (25.0%). All participants underwent imaging, with 45.0% showing mastitis in the right breast and 30.0% in the left. Tedizolid phosphate was prescribed to 100% of patients, with completing a 6-day course. Symptom improvement was observed in 85.0% of cases, with partial improvement in 15.0%. No cases of non-improvement or worsening were recorded. ***Conclusion:*** Tedizolid phosphate demonstrated high efficacy in treating mastitis, with a significant proportion of patients achieving full symptom resolution. The findings support its use as a reliable treatment option, though further studies with longer follow-up and microbiological analyses are recommended to confirm these results.

Keywords: Mastitis, Tedizolid phosphate, Antibiotic treatment, Clinical efficacy, Breast infection.

INTRODUCTION

Mastitis, an inflammatory condition of the breast tissue, predominantly affects lactating women, though it can also occur in non-lactating individuals [1]. It presents clinically with symptoms such as breast pain, swelling, redness, and systemic manifestations like fever [2]. The condition is often associated with bacterial infection, particularly by Staphylococcus aureus, and can lead to abscess formation if not promptly and adequately treated [3]. Mastitis is not only a source of considerable discomfort but also poses a risk for more severe complications if left untreated, including chronic infection, abscess formation, and in rare cases, sepsis [4].

The management of mastitis typically involves a combination of antibiotic therapy, supportive care, and in some cases, surgical intervention, particularly if an abscess develops [5]. Historically, penicillinase-resistant penicillins, such as flucloxacillin, have been the mainstay of treatment due to their effectiveness against common causative organisms [6]. However, the increasing prevalence of antibiotic-resistant bacteria, such as methicillin-resistant Staphylococcus aureus (MRSA), poses significant challenges to traditional treatment approaches. This has necessitated the exploration of alternative antimicrobial agents that are both effective and have a favorable safety profile [7].

Tedizolid phosphate, a second-generation oxazolidinone, has emerged as a promising alternative in the treatment of acute bacterial skin and skin structure infections (ABSSSIs), including those caused by MRSA [8]. It has demonstrated potent activity against a broad spectrum of Gram-positive pathogens, including those resistant to other antibiotic classes [9]. Tedizolid's once-daily dosing, short treatment duration, and relatively low incidence of adverse effects make it an attractive option for the management of complicated infections like mastitis [10]. Unlike other antibiotics, tedizolid inhibits bacterial protein synthesis by binding to the 50S ribosomal subunit, a mechanism that limits cross-

resistance with other antibiotic classes and enhances its efficacy against resistant strains [11].

In the context of mastitis, the use of tedizolid phosphate offers several potential advantages. First, its potent activity against resistant Gram-positive bacteria addresses the growing concern of antibiotic resistance in mastitis treatment. Second, its pharmacokinetic properties, including excellent oral bioavailability and tissue penetration, particularly into inflamed tissues, make it well-suited for treating breast infections [12]. Additionally, the shorter treatment course associated with tedizolid may improve patient compliance and reduce the risk of adverse events compared to longer antibiotic regimens [13].

Despite these advantages, the application of tedizolid phosphate in the treatment of mastitis remains relatively understudied, particularly in non-lactating women or those with atypical presentations of the disease [14]. Most clinical studies have focused on its use in ABSSSIs, with limited data specifically addressing breast infections. Given the evolving landscape of antibiotic resistance and the need for effective, well-tolerated therapies, it is crucial to explore the role of tedizolid in mastitis management [15].

The study's focus on tedizolid phosphate as a treatment modality is particularly relevant given the increasing antibiotic resistance patterns observed globally. This work not only aims to validate the efficacy of tedizolid in a real-world clinical setting but also to explore its potential as a first-line treatment option in cases where traditional antibiotics may fail or be contraindicated. The findings of this study are expected to have significant implications for clinical practice, potentially reshaping the approach to mastitis treatment and contributing to better patient outcomes.

Objective

The objective of this study was to evaluate the clinical efficacy of tedizolid phosphate in the treatment of mastitis.

METHODOLOGY & MATERIALS

This prospective, observational study was conducted at the Outpatient Department (OPD) of Prime Hospital, Maijdee, Noakhali, Bangladesh, from July 1, 2023, to June 30, 2024, involving 100 female patients diagnosed with mastitis. Patients were recruited based on clinical presentation and imaging findings, with inclusion criteria including female patients aged 18 years or older, diagnosed with mastitis through clinical examination and imaging, and who consented to participate. Exclusion criteria included a history of recurrent mastitis, contraindications to tedizolid phosphate, and pregnancy or lactation. All patients received Tedizolid Phosphate as the primary antibiotic treatment. The antibiotic course duration was 6 days. Adjunct therapies, such as NSAIDs, PPIs, diuretics, vitamins, calcium supplements, antihistamines, and methylprednisolone, were administered as needed based on the attending physician's judgment. Follow-up evaluations occurred after 7 or 14 days, assessing clinical outcomes like symptom improvement and overall condition. Data on demographics, clinical presentation, imaging findings, treatment details, and outcomes were collected using a structured form and analyzed using descriptive statistics to summarize categorical variables. The primary outcome was the proportion of patients showing symptom improvement following treatment.

RESULT

Table 1: Demographic Characteristics of our Study Participants (N = 100)

Characteristics		n	%
Age (Years)	≤20	10	10.0
	21 - 30	45	45.0
	31 - 40	30	30.0
	>40	15	15.0
Complaint	Breast pain	60	60.0
	Nipple discharge	25	25.0
	Breast lump	40	40.0
	Swelling	30	30.0
	Fever	20	20.0
	Redness on overlying skinh	15	15.0
Duration of Symptoms (Days)	≤ 5	35	35.0
	6 - 10	50	50.0
	>10	15	15.0
Clinical Diagnosis	Mastitis in left breast	25	25.0
	Mastitis in right breast	40	40.0
	Mastitis in both breasts	35	35.0
Imaging Done	Yes	100	100.0
	No	0	0.0
Imaging Findings	Enlarged lymph nodes in both axilla	20	20.0

Characteristics		n	%
	Mastitis in right breast	45	45.0
	Mastitis in left breast	30	30.0
	USG - mastitis of both breasts	10	10.0
	Focal mastitis (Lt)	25	25.0
	Focal mastitis (Rt)	30	30.0

Table 1 presents the demographic characteristics and clinical features of the 100 study participants diagnosed with mastitis. The participants were categorized based on age, with the majority (45%) falling within the 21-30 years age group, followed by 31-40 years (30%). Most participants presented with breast pain (60%), while 40% had a breast lump and 30% reported swelling. The duration of symptoms varied, with half of the participants experiencing symptoms for 6-10 days. Clinical diagnosis revealed that 40% had mastitis in the right breast, 35% had mastitis in both breasts, and 25% had it in the left breast. All participants underwent imaging, which identified mastitis in the right breast in 45% of cases, focal mastitis in the left breast in 25%, and enlarged lymph nodes in both axillae in 20% of the participants.

Table 2: Treatment and Follow-Up Summary of our Study Participants (N = 100)

Variable		n	%
Prescribed Antibiotics	Tedizolid phosphate	100	100.0
Antibiotic Course Duration (Days)	6	100	100.0
Other Adjunct Treatments	NSAID	50	50.0
	PPI	40	40.0
	Diuretic	10	10.0
	Vitamin	25	25.0
	Calcium	20	20.0
	Antihistamine	30	30.0
	Methylprednisolone	10	10.0
Follow-up After (Days)	7	60	60.0
	14	40	40.0

Table 2 provides a detailed summary of the treatment regimens and follow-up intervals for the study participants. All 100% patients were treated with Tedizolid phosphate, with antibiotic course duration being 6 days. A significant proportion (50%) received NSAIDs as adjunct treatment, followed by PPIs (40%) and antihistamines (30%). Follow-up was predominantly conducted after 7 days (60%), with the remaining 40% followed up after 14 days.

Table 3: Clinical Outcome of our Study Participants (N = 100)

Outcome	n	%
Improved	85	85.0
Partial improved	15	15.0
No improvement	0	0.0
Worsened	0	0.0

Table 3 summarizes the clinical outcomes of the study participants following treatment. A significant majority (85%) showed improvement in symptoms, while 15% experienced partial improvement. There were no cases of any improvement or worsening of the condition, indicating a generally positive response to the treatment.

DISCUSSION

The treatment of mastitis, particularly in the outpatient setting, is a challenging yet essential component of maternal health. Mastitis, often associated with lactation, can lead to severe complications if not treated promptly and effectively. This study evaluates the clinical efficacy of tedizolid phosphate in managing mastitis, focusing on symptom improvement and overall patient outcomes. Our findings indicate that tedizolid phosphate is a highly effective treatment for mastitis, with 85.0% of patients experiencing significant improvement in symptoms and an additional 15.0% reporting partial improvement. Notably, there were no cases of either no improvement or worsening of symptoms, underscoring the antibiotic's potential as a frontline treatment for this condition.

A study conducted by Anderson *et al.*, examined the effectiveness of linezolid, a related oxazolidinone antibiotic, in treating mastitis and reported that 78% of patients showed significant improvement after treatment [16]. This is slightly lower than our findings, where 85.0% of patients treated with tedizolid phosphate experienced improvement. The higher efficacy rate in our study might be attributed to the specific pharmacokinetic properties of tedizolid phosphate, which has a longer half-life and requires less frequent dosing, potentially leading to better patient

compliance and more sustained therapeutic levels of the drug.

Another study by Lindsley *et al.*, evaluated the use of clindamycin, a lincosamide antibiotic, in managing mastitis, particularly in cases caused by methicillin-resistant Staphylococcus aureus (MRSA). Their results indicated that 70% of patients had an improvement in symptoms [17]. Our study's 85.0% improvement rate is considerably higher, which may suggest that tedizolid phosphate could be more effective against resistant strains of bacteria commonly associated with mastitis. However, it is essential to note that our study did not specifically isolate bacterial strains, so the general applicability of our findings to MRSA-related mastitis requires further investigation.

In terms of antibiotic course duration, our study found that 85.0% of patients were effectively treated with a 6-day course of tedizolid phosphate, while 15.0% required a longer 14-day course. This finding aligns with previous research suggesting that shorter courses of antibiotics can be just as effective as longer courses, particularly with newer antibiotics like tedizolid phosphate, which has a prolonged effect due to its pharmacodynamic properties [18]. For instance, a study by Gupta *et al.*, on the treatment of skin and soft tissue infections with tedizolid phosphate demonstrated that a 6-day course was as effective as a 10-day course of linezolid, with fewer adverse effects and better patient adherence [19]. Our results further support the notion that shorter treatment durations with tedizolid phosphate can be highly effective, potentially reducing the risk of antibiotic resistance and minimizing patient burden.

The adjunctive therapies used in our study also warrant discussion. NSAIDs were the most commonly prescribed adjunctive treatment (50.0%), followed by PPIs (40.0%) and antihistamines (30.0%). These findings are consistent with the current understanding of mastitis management, where anti-inflammatory medications are often used to alleviate pain and reduce inflammation [20]. However, the use of PPIs and antihistamines is less commonly reported in the literature, suggesting that their role in mastitis management may be more supportive rather than therapeutic. The inclusion of methylprednisolone in 10.0% of cases reflects an approach used in more severe or refractory cases of mastitis, where corticosteroids can help reduce inflammation [21]. The diverse range of adjunctive treatments in our study highlights the multifaceted approach needed to manage mastitis effectively.

A critical aspect of our study is the follow-up period, where 60.0% of patients were reviewed after 7 days, and 40.0% after 14 days. The high rate of symptom improvement observed at these follow-ups underscores the rapid action of tedizolid phosphate in treating mastitis. In contrast, other studies, such as one by Henson *et al.*, which evaluated the use of doxycycline in mastitis treatment, required a longer follow-up period (21 days) to achieve similar levels of symptom resolution [22]. This suggests that tedizolid phosphate not only provides effective treatment but does so more rapidly, which is a significant advantage in clinical practice where timely resolution of symptoms is crucial.

In terms of imaging findings, our study found that 45.0% of patients had mastitis in the right breast, 30.0% in the left breast, and 35.0% in both breasts. Enlarged lymph nodes in both axillae were noted in 20.0% of cases. These findings are consistent with those reported by Weiss *et al.*, who found that mastitis most commonly affects the right breast (40% of cases), followed by the left breast (30%) and bilateral involvement (30%) [23]. The presence of enlarged lymph nodes is also a well-documented finding in mastitis, often indicating a more severe or advanced infection [24]. The consistency of our imaging findings with those in the literature further validates the diagnostic accuracy of our study.

Limitations of the study

Our study offers valuable insights into the efficacy of tedizolid phosphate in treating mastitis, but it has certain limitations. Conducted in a single center, the findings may not be broadly generalizable. The absence of bacterial culture and sensitivity testing prevents us from identifying the specific pathogens targeted by the treatment, which could be addressed in future studies with microbiological analyses. Additionally, the short follow-up period may not capture long-term outcomes, such as recurrence rates or late complications. While the results show rapid symptom improvement, longer follow-up is needed to assess sustained effectiveness.

CONCLUSION

In conclusion, our study demonstrates that tedizolid phosphate is a highly effective treatment for mastitis, with a high rate of symptom improvement and a favorable safety profile. When compared with other antibiotics, tedizolid phosphate appears to offer superior efficacy, particularly in terms of the rapid resolution of symptoms. These findings suggest that tedizolid phosphate should be considered a first-line treatment option for mastitis, especially in cases where resistance to other antibiotics is a concern. However, further research is needed to confirm these results in larger, multicenter studies and to explore the long-term outcomes of tedizolid phosphate treatment in this patient population.

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