Original Article:

Comparative Study of Efficacy of Mupirocin and Retapamulin in Impetigo

Yasmin Ara Zaman[1], Dilruba Sharmin[2], Swarna Tribedi[3], Azmiree binte Aslam[4]

1. Lab Aid Diagnostic center
2. Skinn by Prof M N Huda
3. Sunamganj 250 bed District Sadar Hospital. Sunamganj, Sylhet.
4. Dr. Sirajul Islam Medical College and Hospital Ltd.

Abstract

Background: Bacterial skin infections are common dermatological conditions, frequently caused by Staphylococcus aureus and group A β-hemolytic Streptococcus pyogenes. The most frequent presentations is impetigo. Impetigo is a contagious bacterial skin infection that affects both adults and children. Topical antibiotics are widely recommended due to their localized efficacy and tolerability. Among these, mupirocin is well established, while retapamulin represents a newer pleuromutilin antibiotic with low resistance potential. **Objective:** To compare the efficacy and safety of retapamulin and mupirocin ointment in the treatment of Impetigo. **Methods:** This analytic study included 100 patients with bacterial skin impetigo attending the outpatient and inpatient departments of Dhaka Medical College Hospital. Patients were randomized into two equal groups: 50 patients received retapamulin ointment and rest received mupirocin ointment twice daily for 14 days. Clinical assessments were conducted at baseline and day 7. Patients with prior adverse drug reactions, pregnancy, lactation, or hepatic/renal dysfunctions were excluded. Clinical outcomes were measured using Investigator's Global Assesement (IGA) scale. **Results:** The mean age was 31.7 ± 10.4 years, most (44%) were aged 18–28 years, and females constituted 60% of the study population. At baseline, severe erythema was more frequent in the mupirocin group (64% vs. 44%), while retapamulin patients showed less crusting and more moderate tissue warmth. Clinical efficacy analysis revealed that retapamulin produced faster improvement, with significantly higher rates of clinical success at day 7 (48% vs. 22%), day 10 (84% vs. 46%), and day 14 (84% vs. 62%), though by day 21 outcomes were nearly equal (96% vs. 90%). Both drugs were well tolerated, with mild irritation (20% retapamulin, 14% mupirocin), pruritus (2% vs. 8%), and one case of allergic contact dermatitis in the mupirocin group, none of which were statistically significant. **Conclusion:** Mupirocin and retapamulin were found to be safe and nearly equally effective in treating impetigo, with retapamulin showing slightly earlier clinical improvement.

Keywords: Impetigo; Mupirocin; Retapamulin; Topical antibiotics.

Introduction

Impetigo remains one of the most frequently encountered conditions in clinical practice, affecting individuals across all age groups. Staphylococcus aureus and group A β-hemolytic Streptococcus pyogenes are the predominant pathogens, especially in eczematous, traumatized, or immunocompromised skin. Impetigo, in particular, is highly contagious and widespread among children aged 2–5 years, although it can affect any age group. Globally, it contributes substantially to the burden of dermatological diseases, with over 11 million cases of S. aureus-related skin and soft tissue infections reported annually in the United States alone.[1,2]

The development of topical antimicrobial agents has provided effective, localized, and well-tolerated treatment options, reducing reliance on systemic therapy. Topical antibiotics such as mupirocin have long been the mainstay for impetigo. Evidence shows that topical agents, particularly mupirocin and the newer retapamulin, achieve significantly higher cure and improvement rates compared to placebo and are at least as effective as oral antimicrobials like erythromycin and flucloxacillin.[6,7]

Corresponding author
Dr. Yasmin Ara Zaman, e-mail: tashaara3@gmail.com, Cell: +880 1716-304555
Cite this Article:
Zaman YA; Sharmin D; Aslam AB; Tribedi S. Comparative Study of Efficacy of Mupirocin and Retapamulin in Impetigo. Ban Acad Dermatol. 2025; 05 (02): 8-14

Available at: www.jbadbd.com
An official publication of Bangladesh Academy of Dermatology (B.A.D.)

Mupirocin (Bactroban®) is the most widely prescribed topical antibiotic, with millions of annual prescriptions worldwide. It is available in both branded and generic formulations, making it relatively affordable.[7,8] Retapamulin, on the other hand, represents the first new topical antibacterial in nearly two decades. Derived from pleuromutilins, it has potent activity against Gram-positive bacteria and a lower potential for resistance development due to its unique mechanism of inhibiting bacterial protein synthesis at multiple steps.9,10 Approved by the U.S. Food and Drug Administration in 2007 for the treatment of impetigo, retapamulin has since been explored as an alternative to mupirocin in managing common skin infections.[9]

Given the high prevalence of bacterial skin infections, their potential for community spread, and the increasing concern of antimicrobial resistance, it is important to evaluate the comparative efficacy and safety of available topical agents. This study therefore investigates mupirocin and retapamulin in patients with bacterial skin infections, aiming to provide evidence that may guide clinical practice in dermatology.

Methods

This cross-sectional comparative study was conducted in the Department of Dermatology and Venereology, Dhaka Medical College and Hospital, from July to December 2016. A total of 100 patients aged 18–60 years with clinically diagnosed impetigo were included using purposive sampling. Patients with mixed fungal or viral infections, pregnant or lactating women, those who had received topical antibiotics within the previous week or systemic antibiotics within the past four weeks, and those unwilling to consent were excluded. Participants were randomly assigned to two equal groups: 50 received retapamulin 1% ointment twice daily for 14 days, and 50 received mupirocin 2% ointment twice daily for 14 days. Treatment durations were chosen according to standard product recommendations and clinical practice guidelines. Both groups were followed for 21 days to assess sustained clinical outcomes. Clinical assessments were performed at baseline, day 7, day 10, day 14, and day 21. Parameters included were erythema, edema, purulence, crusting, tissue warmth, and pain and clinical severity determined by absent, mild, moderate, and severe.

Clinical response was classified as follows:

- **Clinical improvement:** complete resolution of symptoms and signs.
- **No change:** <50% reduction in clinical severity without deterioration.
- **Clinical failure:** Worsening or new lesion formation after treatment. Data were collected using a structured questionnaire through direct interview, medical history, and clinical examination. Statistical analyses were performed using SPSS version 17. Quantitative data were expressed as mean ± SD, and qualitative data as percentages. Chi-square (χ^2) test was done and $p < 0.05$ considered statistically significant.

Ethical implication

Prior to commencement, the study protocol, including its aims, objectives, procedures, potential risks, benefits, and alternatives, was reviewed and approved by the Institutional Review Board (IRB)/Ethical Review Committee of Dhaka Medical College. The details of the study were explained to all participants in the local language, and written informed consent was obtained before enrollment. Patients were assured of their right to refuse or withdraw from the study at any stage without any effect on their standard care. No financial incentives were offered. Confidentiality of all personal data and clinical records was strictly maintained. The study was conducted in accordance with the principles of the Declaration of Helsinki and aimed to improve rational case management for the benefit of both patients and dermatologists.

Results

Table-1 shows the socio-demographic profile of the respondents. The mean age was 31.7 ± 10.4 years, with the majority in the 18–28 years group (44%). Females comprised 60% of the study population. Most patients (69%) came from large families (≥5 members), with a mean family size of 5.65 ± 1.88. The mean monthly income was Tk. 14,295 ± 8363, with the largest group (37%) earning between Tk. 5000–10,000. Nutritional status revealed that 69% had normal BMI, while 16% were underweight and 15% overweight.

Table-2 shows the distribution by site of bacterial involvement. Extremities were the most frequently affected site (51%), followed by the face (13%) and back (13%), while the neck was least affected (2%).

Table-3 illustrates the baseline clinical presentation in both groups. Severe erythema was more frequent in the mupirocin group (64% vs. 44%), while purulence was also slightly higher. Crusting was absent in a greater proportion of retapamulin cases (74% vs. 60%). Tissue warmth was more often moderate in the retapamulin group (72% vs. 44%). Pain was predominantly moderate in both groups. Table 4 shows the comparative clinical efficacy of retapamulin and mupirocin at different follow-up intervals. At day 7, clinical success was higher in the retapamulin group (48% vs. 22%, p=0.006), though

improvement rates were similar. At day 14, retapamulin continued to show superiority (84% vs. 62% success, p=0.013), although some mupirocin patients still showed improvement or no response. By the final follow-up on day 21, however, the outcomes between the two groups were nearly equal (96% vs. 90% success, p=0.238), with no significant differences in any response category. Table-5 shows side effects. Irritation was slightly higher in retapamulin patients (20% vs. 14%), while pruritus was more frequent with mupirocin (8% vs. 2%). One case of allergic contact dermatitis occurred in the mupirocin group. Differences were not statistically significant, indicating both agents were generally safe and well tolerated.

Table 1: Socio-demographic Characteristics of the Respondents (n=100)

Variable	Category	Frequency	Percentage	Mean ± SD
Age (years)	18–28	44	44.0	31.7 ± 10.4
	29–38	28	28.0	
	39–48	21	21.0	
	>48	7	7.0	
Gender	Male	40	40.0	
	Female	60	60.0	
Family size	2	2	2.0	5.65 ± 1.88
	3	7	7.0	
	4	22	22.0	
	≥5	69	69.0	
Monthly income (Tk.)	<5000	13	13.0	14295 ± 8363
	5000–10000	37	37.0	
	10000–20000	34	34.0	
	>20000	16	16.0	
BMI (kg/m²)	Underweight (<18.5)	16	16.0	21.8 ± 3.8
	Normal (18.5–24.9)	69	69.0	
	Overweight (≥25)	15	15.0	

Table-2: Distribution of the subjects by site of bacterial involvement (n=100)

Site of involvement	Frequency	Percentage (%)
Chest	11	11.0
Face	13	13.0
Neck	2	2.0
Back	13	13.0
Trunk	10	10.0
Extremities	51	51.0
Total	100	100.0

Table-3: Distribution of the subjects' clinical presentation in two groups (n=100)

Clinical diagnosis		Retapamulin (n=50) No. (%)	Mupirocin (n=50) No. (%)
Erythema	Minimal	3(6.0%)	2(4.0%)
	Moderate	23(46.0%)	16(32.0%)
	Severe	22(44.0%)	32(64.0%)
	Absent	2(4.0%)	0(0.0%)
Purulence	Minimal	18(36.0%)	25(50.0%)
	Moderate	11(22.0%)	15(30.0%)
	Absent	18(36.0%)	10(20.0%)
Crusting	Minimal	8(16.0%)	15(30.0%)
	Moderate	5(10.0%)	5(10.0%)
	Absent	37(74.0%)	30(60.0%)
Tissue edema	Minimal	23(46.0%)	27(54.0%)
	Moderate	20(40.0%)	13(26.0%)
	Absent	7(14.0%)	10(20.0%)
Tissue warmth	Minimal	10(20.0%)	23(46.0%)
	Moderate	36(72.0%)	22(44.0%)
	Absent	4(8.0%)	5(10.0%)
Pain	Absent	1(2.0%)	4(8.0%)
	Minimal	2(4.0%)	9(18.0%)
	Moderate	38(76.0%)	35(70.0%)
	Severe	9(18.0%)	2(4.0%)

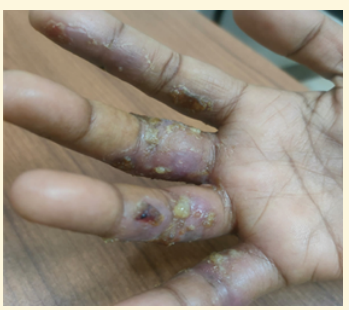

Figure.1: Impetigo on hand

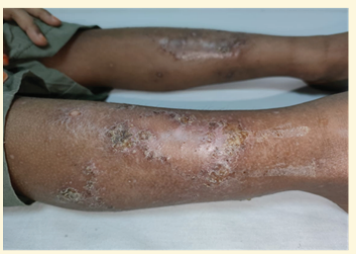

Figure.2: Impetigo over the shins in atopic dermatitis, note the golden crusts

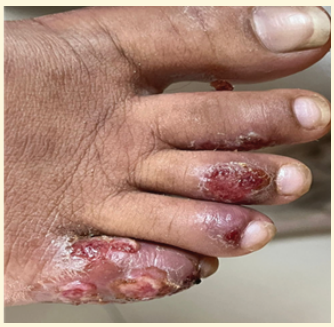

Figure.3: Impetigo over the toes

Table-4: Comparison of clinical efficacy between two groups (n=100)

Clinical efficacy	Retapamulin (n=50) No. (%)	Mupirocin (n=50) No.(%)	p value
At 7th day follow up			
Clinical improvement	24(48.0%)	11(22.0%)	0.006^{s}
No change	3(6.0%)	13(26.0%)	0.006^{s}
At 14th day follow up			
Clinical improvement	42(84.0%)	31(62.0%)	0.013^{s}
No change	4(8.0%)	12(24.0%)	0.029^{s}
Clinical failure	1(2.0%)	0(0.0%)	1.000^{ns}
At 21st day follow up			
Clinical improvement	48(96.0%)	45(90.0%)	0.238^{ns}
No change	8(16.0%)	13(26.0%)	0.219^{ns}
Clinical failure	7(14.0%)	3(6.0%)	0.182^{ns}

Data were analyzed by Chi-square test between two groups ns=not significant; s= significant

Table-5: Distribution of the study patients by side effects between in groups (n=100)

Side effects	Retapamulin (n=50) No. (%)	Mupirocin (n=50) No. (%)	P value
Pruritus	1(2.0%)	4(8.0%)	0.169 ^{ns}
Irritation	10(20.0%)	7(14.0%)	0.424 ^{ns}
ACD	0(0.0%)	1(2.0%)	0.315 ^{ns}

Data were analyzed by Chi-square test between two groups ns=not significant

Discussion

The objective of the present study was to compare the safety and efficacy of mupirocin and retapamulin in the management of impetigo among patients attending the Department of Dermatology and Venereology at Dhaka Medical College Hospital. A total of 100 patients were included, with 50 patients treated with retapamulin ointment and 50 with mupirocin ointment. Both drugs are well-established topical antimicrobials used in the management of uncomplicated bacterial skin infections, which are among the most common presentations in dermatology practice.[11,12]

The findings of the present study can be compared with those of Koning et al.[13] who conducted a randomized controlled trial involving 213 patients, of which 139 received retapamulin and 71 received placebo. Their study demonstrated that retapamulin was significantly more effective than placebo, with clinical success rates of 85.6% versus 52.1% ($p < 0.001$). Similar efficacy was confirmed in per-protocol analyses and in patients with pathogen-confirmed infections at baseline. In contrast, the present study did not include a placebo arm but directly compared retapamulin with another widely used topical antibiotic, mupirocin. This head-to-head comparison showed that while retapamulin demonstrated faster initial clinical improvement, the overall clinical responses at the end of follow-up were nearly equivalent, suggesting that both agents remain effective therapeutic options in this setting.

The patient demographics of this study also differ from some previously published trials. For example, Bohety et al.14 studied a broad age range (9 months to 98 years), where 73.7% of the patients were below 18 years. In contrast, the present study included only adults, with 44% aged 18–28 years, 28% aged 29–38 years, 21% aged 39–48 years, and 7% older than 48 years, with a mean age of 31.7 ± 10 years. Regarding diagnosis, this study reported that 25% of patients had impetigo, 71% had folliculitis, and 4% had furunculosis, which aligns with global epidemiological trends that identify folliculitis and impetigo as the most common superficial bacterial skin infections.[15]

In terms of clinical presentation, Bohety et al.[14] observed in their retapamulin group that erythema was moderate in 71% of cases, purulence was absent in 97%, crusting was absent in 71%, tissue edema minimal in 54%, tissue warmth minimal in 57%, and pain minimal in 54%. Comparatively, the present study found erythema to be moderate in 46% of retapamulin patients but severe in 64% of mupirocin patients, suggesting that the mupirocin group presented with more severe baseline disease. Purulence was minimal in 36% of the retapamulin group and 50% of the mupirocin group, while crusting was absent in 74% and 60%, respectively. Tissue edema was minimal in 46% of retapamulin patients and 54% of mupirocin patients, whereas tissue warmth was moderate in 72% of retapamulin patients but only minimal in 46% of mupirocin patients. Pain was predominantly moderate in both groups (76% in retapamulin and 70% in mupirocin). These findings highlight minor variations in baseline clinical severity, but overall support that both agents are effective in reducing signs of inflammation over time.

With respect to treatment outcomes, the present study demonstrated that retapamulin produced earlier clinical improvement. At day 10, 84% of retapamulin patients had achieved clinical success compared with 46% in the mupirocin group, a statistically significant difference ($p<0.001$). However, by day 21, both groups reached comparable clinical success rates (96% vs. 90%). These findings suggest that retapamulin may provide more rapid symptomatic relief, which could be particularly advantageous in acute community or pediatric settings where faster resolution reduces the risk of transmission.[11,16]

In terms of safety, this study reported mild irritation in 20% of retapamulin patients and 14% of mupirocin patients, while pruritus and allergic contact dermatitis were rare. Koning et al.[13] similarly reported pruritus at the application site in 6% of retapamulin users compared to 1% of placebo users. Bohety et al.[14] also observed that adverse events with retapamulin were infrequent, mild to moderate in severity, and no serious events occurred. These findings confirm the favorable safety profile of topical retapamulin, consistent with other clinical trials and post-marketing surveillance data.[17,18]

Taken together, the results of this study reinforce the efficacy and safety of both mupirocin and retapamulin in the treatment of bacterial skin infections. While retapamulin appears to act more quickly, long-term outcomes are essentially comparable. These findings are consistent with international literature and suggest that both agents remain valuable options in dermatological practice, with the choice guided by factors such as cost, availability, and patient tolerance.

Conclusion

This study evaluated the comparative efficacy and safety of retapamulin and mupirocin in the treatment of impetigo among patients at Dhaka Medical College Hospital. Both agents proved effective and well tolerated, with retapamulin demonstrating faster clinical improvement in the early stages of therapy, while final outcomes after three weeks were similar in both groups. These findings suggest that retapamulin may be preferred when rapid symptom relief is desired, although both drugs remain reliable options for routine management of impetigo.

References

1. Brown J, Shriner DL, Schwartz RA, Janniger CK. Impetigo: an update. International journal of dermatology. 2003 Apr 1;42(4): 1-5.
2. Feaster T, Singer JI. Topical therapies for impetigo. Pediatric emergency care. 2010 Mar 1;26(3):222-7.
3. Jaworsky C, Gilliam AC. Immunopathology of the human hair follicle. Dermatologic clinics. 1999 Jul 1;17(3):561-8.
4. Raz R, Miron D, Colodner R, Staler Z, Samara Z, Keness Y. A 1-year trial of nasal mupirocin in the prevention of recurrent staphylococcal nasal colonization and skin infection. Archives of Internal Medicine. 1996 May 27;156(10):1109-12.
5. Hirschmann JV. Impetigo: etiology and therapy. Current clinical topics in infectious diseases. 2002 Jan 1;22:42-51.
6. Pangilinan R, Tice A, Tillotson G. Topical antibiotic treatment for uncomplicated skin and skin structure infections: review of the literature. Expert review of anti-infective therapy. 2009 Oct 1;7(8):957-65.
7. IMS Medical Statistics. NDTI Audit 2006. Plymouth Meeting, PA, USA: IMS; 2006.
8. Britton JW, Fajardo JE, Krafte-Jacobs B. Comparison of mupirocin and erythromycin in the treatment of impetigo. J Pediatr. 1990;117(5):827–9.
9. Weinberg JM, Tyring SK. Retapamulin: an antibacterial with a novel mode of action in an age of emerging resistance to Staphylococcus aureus. J Drugs Dermatol. 2010;9(10):1198–204.
10. Yan K, Madden L, Choudhry AE, Voigt CS, Copeland RA, Gontarek RR. Biochemical characterization of the interactions of the novel pleuromutilin derivative retapamulin with bacterial ribosomes. Antimicrob Agents Chemother. 2006;50(11):3875–81.
11. Bowen AC, Mahé A, Hay RJ, Andrews RM, Steer AC, Tong SYC, et al. The global epidemiology of impetigo: a systematic review of the population prevalence of impetigo and pyoderma. PLoS One. 2015;10(8):e0136789.
12. Hay RJ, Johns NE, Williams HC, Bolliger IW, Dellavalle RP, Margolis DJ, et al. The global burden of skin disease in 2010: an analysis of the Global Burden of Disease Study 2010. J Invest Dermatol. 2014;134(6):1527–34.
13. Koning S, van der Sande R, Verduijn MM, van Suijlekom-Smit LW, Morris AD, Butler CC, et al. Retapamulin ointment versus placebo in impetigo: randomized controlled trial. Br J Dermatol. 2008;158(5):1077–82.
14. Bohety BR, Friedlander SF, Baldwin HE, Yan AC, Blume-Peytavi U, Oranje AP, et al. Retapamulin ointment: safety and efficacy in the treatment of superficial skin infections in children and adults. Pediatr Dermatol. 2015;32(1):38–46.
15. Stevens DL, Bisno AL, Chambers HF, Dellinger EP, Goldstein EJ, Gorbach SL, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis. 2014;59(2):147–59.
16. Oranje AP, Chosidow O, Sacchidanand S, Todd G, Singh H, Scangarella-Oman NE, et al. Topical retapamulin

ointment 1% in the treatment of secondarily infected dermatitis: a randomized, double-blind, placebo-controlled, multicenter study. J Am Acad Dermatol. 2010;62(6):990–9.
17. Hoeger PH, Yan AC, Harper J, Zehender H, Scangarella N, Arrieta A. Safety and efficacy of retapamulin ointment in the treatment of secondarily infected traumatic lesions in children. Int J Dermatol. 2009;48(6):628–36.
18. Oranje AP, Strobos MA, Eichenfield LF. Retapamulin: a novel topical antibiotic. Drugs Today (Barc). 2009;45(1):15–22.