Comparative Evaluation of Efficacy of Clindamycin and Trimethoprim - Sulfamethoxazole for Treating Patients with Uncomplicated Skin Infections

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ABSTRACT

Background: The most common bacterial causes of skin and soft tissue infections (SSTI) are group A Streptococcus (GAS) and Staphylococcus aureus, the key bacterial agents of impetigo, cellulitis, abscesses, and wound infections. Aim of the study: To compare efficiency of clindamycin and trimethoprim-sulfamethoxazole for treating patients with uncomplicated skin infections. Materials & Methods: The study was conducted in the department of general medicine of the Government S.K. Hospital, Sikar, Rajasthan, India. For the study we selected subjects from the surgical ward of the hospital of the medical institute. The patients diagnosed with uncomplicated skin infection were included in the study. A total of 42 patients were selected for the study. Results: A total of 42 patients were enrolled, 21 in group 1 and 21 in group 2. We observed that clinical cure at 17-20 days was 78.03% in Group 1 and 74.31% in group 2. Clinical cure at one month follow up was 71.22% in group 1 and 65.21% in group 2. Clinical cure in adults in group 1 was 76.2% and in group 2 was 74.84%. Clinical cure in pediatrics was 83.29% in group 1 and 79.35% in group 2. Clinical cure rate of abscess for group 1 was 77.96% and for group 2 was 81.21%. Conclusion: Within the limitations of the study we conclude that both the drug combinations i.e., clindamycin and trimethoprim-sulfamethoxazole are equally effective in treating uncomplicated skin infections.

Key words: skin infection, antibiotics, clindamycin, trimethoprim-sulfamethoxazole

INTRODUCTION

The most common bacterial causes of skin and soft tissue infections (SSTI) are group A Streptococcus (GAS) and Staphylococcus aureus, the key bacterial agents of impetigo, cellulitis, abscesses, and wound infections.[1] Impetigo is driven by GAS in resource-poor settings; however, in developed settings, impetigo, including bullous impetigo, is more likely to have S aureus present. Although it is difficult to culture, cellulitis is commonly a GAS infection, whereas S aureus is consistently recovered from abscess specimens.[2] Antimicrobial agents that are able to target both GAS and S aureus are valuable to streamline prescription, improve adherence, and minimize adverse events, and β-lactam agents have served this purpose for decades. However, with the global rise of community-associated methicillin-resistant S aureus (CA-MRSA), non-β-lactam antimicrobial agents have become increasingly important.[3,4] One such antibiotic is sulfamethoxazole-trimethoprim (SXT). Sulfamethoxazole-trimethoprim is a recommended antibiotic for CA-MRSA SSTI, but there is an ongoing belief that SXT is ineffective for GAS SSTI, and dual therapy is often recommended when GAS may be present.[5,6] Hence, we planned the study to compare the efficiency of clindamycin and trimethoprim-sulfamethoxazole for treating patients with uncomplicated SSTI.


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skin infections.

**METHODS**

The study was conducted in the department of dermatology of Government S.K. Hospital, Sikar, Rajasthan. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study we selected subjects from the surgical ward of the hospital of the medical institute. The patients diagnosed with uncomplicated skin infection were included in the study. A total of 42 patients were selected for the study. The inclusion criteria for the study are given below:

- Age ranging from 6 months to 84 years
- At least 2 signs of skin and soft tissue infection
- Able to take medication orally

Exclusion criteria for the study are given below:

- Hospitalization required
- Hospitalized or treatment with anti-staphylococcal antimicrobial therapy in previous 14 days
- Superficial skin infection (impetigo, folliculitis)
- Psychiatric disease or active alcohol or drug use, documented or witnessed animal bite in previous 30 days
- Breast feeding
- Morbid obesity (BMI >40)
- History of immunocompromising condition (e.g. HIV, diabetes, chronic renal failure)

The subjects included in the study randomly grouped into 2 groups, Group1 and Group 2. Subjects in group 1 were prescribed: trimethoprim/sulfamethoxazole 160mg/800mg twice daily (pediatric dose: 8-10mg/kg/day) and subjects in group 2 were prescribed clindamycin 300mg. all the subjects were evaluated for follow up of test of cure visit (TOC) on 7-10 days after completion of 10-day course of therapy and at the one month follow up (day 40).

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student’s t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 was predetermined as statistically significant.

**RESULTS**

Table 1 shows the demographic variables of the study population. A total of 42 patients were enrolled, 21 in group 1 and 21 in group 2 [Fig 1]. Table 2 shows the comparison of clinical efficacy of trimethoprim/sulfamethoxazole and clindamycin for uncomplicated skin infections. We observed that both the drug combinations are effective in treating the uncomplicated skin infections. But the results on comparing were statistically non-significant. The results were compared with previous studies and results were consistent with previous studies. Miller LG et al evaluated the efficacy of various antibiotic regimens in the era of community-acquired methicillin-resistant Staphylococcus aureus (MRSA). They enrolled outpatients with uncomplicated skin infections who had cellulitis, abscesses larger than 5 cm in diameter (smaller for younger children), or both. Patients were enrolled at four study sites. All abscesses underwent incision and drainage. Patients were randomly assigned in a 1:1 ratio to receive either clindamycin or trimethoprim–sulfamethoxazole (TMP-SMX) for 10 days. Patients and investigators were unaware of the treatment assignments and microbiologic test results. The primary outcome was clinical cure 7 to 10 days after the end of treatment. A total of 524 patients were enrolled (264 in the clindamycin group and 260 in the TMP-SMX group), including 155 children (29.6%). One hundred sixty patients (30.5%) had an abscess, 280 (53.4%) had cellulitis, and 82 (15.6%) had mixed infection, defined as at least one abscess lesion and one cellulitis lesion. S. aureus was isolated from the lesions of 217 patients (41.4%); the isolates in 167

**DISCUSSION**

In the present study we compared efficiency of clindamycin and trimethoprim-sulfamethoxazole for treating patients with uncomplicated skin infections.
(77.0%) of these patients were MRSA. The proportion of patients cured was similar in the two treatment groups in the intention-to-treat population and in the populations of patients who could be evaluated. Cure rates did not differ significantly between the two treatments in the subgroups of children, adults, and patients with abscess versus cellulitis. The proportion of patients with adverse events was similar in the two groups. They found no significant difference between clindamycin and TMP-SMX, with respect to either efficacy or side-effect profile, for the treatment of uncomplicated skin infections, including both cellulitis and abscesses. LaPlante KL et al evaluated and compared several antimicrobial compounds against CA-MRSA. Strains with inducible macrolide lincosamide-streptogramin type B (iMLSB) resistance and strains in which resistance was non-inducible were evaluated. Two levels of inocula (105 and 107) were evaluated for clindamycin activity in the in vivo model. In both models, the antimicrobial evaluation was performed in triplicate, and bacterial quantification occurred over 72 h, with drug doses that were designed to simulate the free drug area-under-the-concentration-time curve values (FAUCs) obtained from human samples. When the activity of clindamycin against the iMLSB strains was evaluated, constitutive resistance was noted at 24 h (MIC of >256), and failure was noted at an inoculum of ≥106 in the in vivo models. However, at a low inoculum (105) in the murine thigh-infection model, clindamycin demonstrated modest activity, reducing the CFU/thigh count for clindamycin resistance-inducible strains at 72 h (0.45 to 1.3 logs). Overall, administration of daptomycin followed by vancomycin demonstrated the most significant kill against all strains in both models. Against the clindamycin non-inducible strain, clindamycin and doxycycline demonstrated significant kill. Doxycycline, linezolid, and trimethoprim-sulfamethoxazole (not run in the murine model) demonstrated bacteriostatic activity against clindamycin resistance-inducible isolates. This study demonstrated that, clindamycin’s activity against the iMLSB strains tested is partially impacted by inoculum size.[7,8] Hersh AL et al identified the antibiotic strategy with the highest probability of activity and identified threshold values for epidemiologic variables including bacterial prevalence and antibiotic resistance. They used decision analysis to evaluate three empiric antibiotic strategies: (1) clindamycin, (2) trimethoprim/sulfamethoxazole (T/S) and (3) cephalexin. They calculated the probability of activity against the bacteria causing the infection (CA-MRSA, methicillin-sensitive S. aureus and group A Streptococcus) by incorporating estimates of prevalence and antibiotic resistance to determine the optimal strategy. Sensitivity analysis was used to identify thresholds for prevalence and antibiotic resistance where two strategies were equal. Clindamycin (0.95) and T/S (0.89) had substantially higher probability of activity than cephalexin (0.28) using baseline estimates for bacterial prevalence and antibiotic resistance. Cephalexin was the optimal antibiotic only when CA-MRSA prevalence was <10%. The probability of activity for clindamycin and T/S was highly sensitive to changes in the values for bacterial prevalence (both CA-MRSA and group A Streptococcus) and CA-MRSA resistance to clindamycin. It was concluded that the empiric treatment of SSTIs with either clindamycin or T/S maximizes the probability that the antibiotic will be active when CA-MRSA prevalence is >10%. Cadena J et al investigated whether treatment with a higher dose of trimethoprim-sulfamethoxazole (TMP/SMX) led to greater clinical resolution in patients with skin and soft tissue infections (SSTIs) caused by methicillin-resistant Staphylococcus aureus (MRSA). A prospective, observational cohort with nested case-control study was performed at a public tertiary health system. Among patients with MRSA SSTIs during the period from May 2008 to September 2008 who received oral monotherapy with TMP/SMX and whose clinical outcome was known, the clinical characteristics and outcomes were compared between patients treated with a high dose of TMP/SMX (320 mg/1,600 mg twice daily) for 7 to 15 days and patients treated with the standard dose of TMP/SMX (160 mg/800 mg twice daily) for 7 to 15 days. In patients with MRSA SSTIs, those treated with the high dose of TMP/SMX (n = 121) had clinical characteristics similar to those of patients treated with the standard dose of TMP/SMX (n = 170). The only exception was a higher proportion of patients with a history of trauma upon admission among the patients treated with the higher dose. The proportion of patients with clinical resolution of infection was not different in the two groups. The lack of significance remained in patients with abscess upon stratified analysis by whether surgical drainage was performed. The study found that patients with MRSA SSTIs treated with the higher dose of TMP/SMX (320/1,600 mg twice daily) for 7 to 15 days had a similar rate of clinical resolution as patients treated with the standard dose of TMP/SMX (160/800 mg twice daily) for 7 to 15 days. [9,10]

CONCLUSION

Within the limitations of the study we conclude that both the drug combinations i.e., clindamycin and trimethoprim-sulfamethoxazole are equally effective in treating uncomplicated skin infections.

REFERENCES