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Comparison of Clindamycin and Cotrimoxazole Effect on Cellulitis in Patients Referred to Labafinejad Hospital in 2016_2017

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Abstract

Background and objectives: This study was comparison the effects of Cotrimoxazole and Clindamycin on cellulitis with wound accompanied by purulent drainage or subcutaneous abscess in patients referred to Labafinejad Hospital during 2016_2017. Materials and Methods: 63 patients who had cellulitis with wound accompanied by purulent drainage or subcutaneous abscess were randomly divided into two groups. The first group was divided into two subgroups of inpatient and outpatient, oral clindamycin tablets were administered to outpatient subgroup and intravenous clindamycin was prescribed to inpatient subgroup. The second group was also divided into two subgroups of inpatient and outpatient. The outpatient subgroup received oral cortrimoxazole tablets and cotrimoxazole ampoules were administered intravenously to inpatient subgroup. Results: Patients were observed in two groups 1 and 2, in the first group 41.1% responded to treatment with intravenous clindamycin, in the second one 53.3% responded to treatment with intravenous cotrimoxazole, which did not indicate significant difference with the statistical calculation. Outpatients were evaluated in two groups 3 and 4, the first group responded 40% to oral clindamycin therapy, while the second group responded to treatment with oral cotrimoxazole 62.5%, which was not statistically significant difference. Conclusion: It seems that according to the results of this study, which, of course, cannot be generalized to the whole society, Despite the increasing prevalence of clindamycin resistance in methicillin resistant Staphylococcus aureus strains, none of these two drugs have not priority in treatment cellulitis with purulent drainage or subcutaneous abscess.

Key words: Cellulitis, Clindamycin, Cotrimoxazole

Introduction

Cellulitis is common in outpatient and inpatient patients, and its inappropriate treatment can lead to apparent morbidity and, even in some cases, mortality (Talan et al., 2016). Cellulitis is one of the most common infections in the community and in the hospital. Between 1993 and 2005, the number of patients with Cellulitis referred to the US medical centers increased from 1.2 million to 3.4 million and most patients discharged with oral antibiotics (Pallin et al., 2008). During this period, Acquired methicillin resistant *Staphylococcus aureus* (MRSA) was the most common cause of skin and soft tissue infections in most American medical centers (Moran et al., 2006). In the United States, Acquired methicillin-resistant *Staphylococcus aureus* was the most commonly agent isolated from infectious ulcers with purulent drainage. Cotrimoxazole and clindamycin were the most commonly investigated drugs in the laboratory, they were also the most commonly prescribed drugs for the treatment of soft tissue infections (MRSA) in outpatient setting (Talan et al., 2011; Miller et al., 2015). In 2005, 14.2 million outpatients and 850,000 inpatient patients were treated for soft tissue infections in the USA. The result of cultivation of infectious soft tissue lesions in the United States indicated that the most common cause was acquired methicillin-resistant *Staphylococcus aureus*, and clindamycin and cotrimoxazole were recommended due to low cost and high activity against acquired treatment-resistant *Staphylococcus aureus*. Patients who had cellulitis with purulent drainage are treated with an antibiotic that is effective against methicillin-resistant *staphylococcus aureus* for 10 days, and relapse is uncommon after completion of treatment. Treatment in inpatient or outpatient patients can include cotrimoxazole, clindamycin, vancomycin, linzolid, doptomycin, ticoplanin. Because in our country there is no needful research on the comparison of the efficacy of Cotrimoxazole and Clindamycin in the treatment of Cellulitis with risk factor for MRSA (Cellulitis with a purulent drainage wound or subcutaneous abscess), Especially given the increasing prevalence of clindamycin resistance in MRSA species, we decided to compare the two regimens in aspects of treatment

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response and recovery rates and hospitalization time (Williams et al., 2011).

Methods:

Ethics statement

The ethics committee of School of Medicine, Shahid Beheshti University of Medical Sciences was approved this study (IR.SBMU.MSP.REC.1395.621).

Patients and clinical evaluation

At the time of visit, the biography and medical history of patients were taken and the signs and symptoms of cellulitis with wound accompanied by purulent drainage or subcutaneous abscess including warmth, swelling, redness, tenderness, purulent drainage or subcutaneous abscess as well as vital signs (including temperature) and other clinical findings were recorded. Patients by diagnosis of cellulitis, who had wound and drainage purulent or subcutaneous abscess, after fully informing them about the research and obtaining patient's consent, entered this study and then randomly divided into two groups. The first group was divided into two subgroups of inpatient and outpatient, oral clindamycin tablets (300 mg every 6 hours) were administered to outpatient subgroup and intravenous clindamycin (600 mg every 6-8 hours) was prescribed to inpatient subgroup. The second group was also divided into two subgroups of inpatient and outpatient. The outpatient subgroup received two oral cortrimoxazole tablets (400.80 mg) every 8 hours and two cotrimoxazole ampoules (400.80 mg) were administered every 8 hours intravenously to inpatient subgroup. Patients of two groups of inpatient and outpatient, were compared with each other in terms of symptoms improvement within 48 hours (warmth, swelling, redness, tenderness, purulent drainage or subcutaneous abscess), which were the clinical criteria of treatment response. In the absence of response to therapy during this period, necessary studies were carried out and the treatment change was decided and the patients were evaluated for complete recovery.

Statistical analysis

SPSS version software version 22.0 (IBM Corp., Armonk, USA) was applied for statistical analysis. To assess differences, the Chi-square test with Fisher's exact test was used to compare the discrete variables; the Student t-test was used to analyse continuous variables. A p value <0.05 was considered statistically significant.

Results:

In this research 63 patients with acquired cellulitis were studied in 4 groups. The first group included inpatient patients receiving intravenous clindamycin (17 patients), the second group included inpatient patients receiving intravenous cotrimoxazole (15), the third group included outpatients receiving oral clindamycin (15), and the fourth group included outpatients receiving oral cotrimoxazole (16 people). The distribution of patients based on demographic variables including gender and mean age is shown in table 1. Chi-square or Fisher exact test showed that there was no significant difference between the four groups in terms of measured variables.

Table 1: Distribution of patient' s gender and age

Age	Total	Gender		Group
		Female	Male	
52.9	17	(41.1%) 7	(58.9%) 10	1
53.8	15	(46.7%) 7	(53.3%) 8	2
47.6	15	(53.3%) 8	(46.4%) 7	3
54.7	16	(50%) 8	(50%) 8	4
52.3	63	(47.6%) 30	(52.4%) 33	Total

Clinical response include symptoms improvement after 48 to 72 hours after starting treatment is shown in Tables 2 and 3. By Chi-square or Fisher exact test was specified that there was no significant difference between the two groups in terms of time to improve clinical symptoms and response to treatment.

Table 2: Comparison of response to treatment

Total	No response to treatment	Response to treatment	Group
17	(58.9%) 10	(41.1%) 7	1
15	(46.7%) 7	(53.3%) 8	2

Patients in both groups 1 and 2 were evaluated. The first group responded to treatment with intravenous clindamycin 41.1%. The second group responded to intravenous cotrimoxazole 53.3%. There was no significant difference between the two groups ($p = 0.4902$ and $z = -0.687$) (Table 2).

Table 3: Comparison of response to treatment

Total	No response to treatment	Response to treatment	Group
15	(60%)9	(40%) 6	3
16	(37.5%) 6	(62.5%)10	4

Outpatients were evaluated in two groups 3 and 4, the first group responded 40% to oral clindamycin therapy, while the second group responded to treatment with oral cotrimoxazole (62.5%), which calculated with $p = 0.8888$ and $z = -0.1428$ there was no significant difference (Table 3).

Frequency of side effects and type of side effects of drugs are shown in Tables 3 and 4. These complications were not significantly difference in terms of type and number in the groups under study.

Table 4: Comparison of complications

total	Frequency in group 2	Frequency in group 1	Complication
4	2	2	Epigastric pain
2	0	2	Mild diarrhea
1	0	1	Severe diarrhea *
2	2	0	Mild itching
1	1	0	Severe generalized rush*
1	1	0	Mild rush
	(40%) 6	(29.4%) 5	Total

* This complication lead to change the treatment.

In the course of treatment, 4 patients in group 1 and 5 patients in group 2 had mild drug complication, which did not change the treatment, and the difference between the two groups was not statistically significant. In the first group, one patient (0.06%) and in the second group one patient (0.066%) suffered from a severe drug disorder, which resulted in the discontinuation and change of treatment. Chi-square or Fisher's exact test revealed that the difference between the two groups was not statistically significant (Table 4).

Table 5: Comparison of complications

Total	Frequency in group 4	Frequency in group 3	Complication
1	0	1	Mild diarrhea
2	1	1	Mild itching
3	2	1	Mild rush
	(19%) 3	(20%) 3	Total

3 patients in group 3 and 4 patients in group 4 had mild drug complication, which did not change the treatment and there was no significant difference between the two groups (Table 5).

Out of 63 patients, an abscess drainage culturing was performed for 12 patients and the results of all cases were methicillin-resistant *Staphylococcus aureus* and sensitive to vancomycin.

Discussion:

The distribution of the patients in the two groups was in such a way that the criteria for age, gender and underlying illnesses did not differ significantly between the two groups. Therefore, these factors did not affect the outcome of the study on the effectiveness of the two regimens. Comparison of clinical examinations in the 2nd and 3rd day of treatment between the two treatment groups 1 and 2 showed that the group received the intravenous clindamycin and the group received intravenous cotrimoxazole had no statistically significant difference in terms of clinical symptoms and response to treatment. Also, the comparison of clinical examinations between the two treatment groups 3 and 4 on the second and third day showed that the group received oral clindamycin and the group received oral drug cotrimoxazole did not have statistically significant difference in terms of improvement of clinical symptoms and response to treatment.

Conclusion:

These results were consistent with a study conducted by David Talan, Frank Luccio and his colleagues in the USA between 2009 and 2012. However, in the study, patients who had received clindamycin had a lower incidence of recurrence in the first-time (7-14 days) and second-time (6-8 weeks) of observation (1), and in our study post-treatment investigations for recurrence were not performed. The results obtained in our study were consistent with the results of a study by Loren Miller et al. In 2015 in the United States. It also matched with the results of a study conducted by David Talan, Frank Luccio and his colleagues in the United States from 2009 to 2012 (Williams et al., 2011; Proctor, 2008; Kaplan et al., 1999; Shokouhi, Alavi Darazam and Zamanian, 2017; Michal Stein et al., 2016; Eksi et al., 2011). How ever some references report the prevalence of resistance to clindamycin. Our study reached to an acceptable clinical response in invitro (Shokouhi, Alavi Darazam and Zamanian, 2017; Michal Stein et al., 2016; Eksi et al., 2011; Frazee et al., 2005; Rahimi, Karimi and Pourshafee, 2014; Mobasherizadeh et al., 2016; Moran et al., 2006). It shows non accordance of resistance to clindamycin in invitro and invivo. It seems that according to the results of this study, which, of course, cannot be generalized to the whole society, due to the lack of significant statistical difference in response to treatment and the clinical complications which resulted from treatment with clindamycin and cotrimoxazole, none of these two drugs are prioritized for treatment of cellulitis.

Suggestions:

Considering that in this study, 59.64% of patients who received oral or intravenous clindamycin and 41.49% of patients who received oral or intravenous cotrimoxazole did not respond to treatment, it is recommended not to use these drugs in patients with cellulitis with MRSA risk factor and poor general condition, extensive cellulitis, or in the case of recurrence. In this study, 40.06% of patients who received oral intravenous or oral Clindamycin responded to treatment, whereas in the case of intravenous or oral cotrimoxazole, the response to treatment was 58.06%. There was no statistically significant difference, but considering the limitation of the study, it seems that if a study with a higher volume of sample is performed, different results will be obtained.

In this study, an abscess drainage culturing was performed for 12 patients, 100% of which showed MRSA. Due to the high prevalence of MRSA acquired from the community, it seems that this study should be done in higher volumes. Among the limitations of this study, the lack of referral of improved patients in order to asses recurrence, lack of co-operation of patients for culturing of drainage abscess especially in outpatients and the low number of patients referred in the determined period, can be mentioned.

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