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Original Article

Efficacy of low dose azithromycin versus rifampicin in recurrent furunculosis

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Abstract

Objective To access the efficacy of low dose azithromycin versus rifampicin in recurrent furunculosis.

Methods This study was conducted at the Outpatient Department of Dermatology, DHQ teaching Hospital, Sargodha Medical College Sargodha from February 2019 to November 2019. 250 patients included in this study were divided into two groups containing 125 patients in each group. Both groups washed affected area or body with chlorhexidine soap daily, applied 2% mupirocin on lesions and in nostrils twice daily and took oral 400-600 mg tablet linezolid twice daily for 10-14 days. In addition, group A was prescribed azithromycin 500mg once weekly for next 3 months (12 weeks) and group B was prescribed rifampicin 450-600mg (10mg/kg body weight) once daily half hour before breakfast for 10 days. The drug is considered efficacious if the patient had no episode of furuncles during the 3-month follow-up after completion of full duration of treatment.

Results In group A, 17 patients (13.6%) reported back with recurrent furunculosis in contrast 16 patients (12.8%) of group B reported with recurrent furunculosis.

Conclusion It is concluded that of low dose azithromycin is as efficacious as rifampicin for treatment of recurrent furunculosis.

Key words
Azithromycin, rifampicin, recurrent furunculosis.

Introduction

Dermatological diseases contain a range of different skin problems which have a grave social and psychological impact. One of these problems include a common skin infection commonly referred as a skin boil. Clinically, a boil or furuncle is an infection of hair follicle which can be located at any part of skin. The most common site for development of furuncle is face. Most people get worried when they develop a furuncle again and again even after treatment. So, we use the term recurrent furunculosis for those patients who develop furuncles more than three times in a year.[1] The infection of hair follicle starts from the root of the hair and if immunity is not good or hygienic condition of the patient is poor, the infection

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aggravates. It can infect the surrounding tissue and lead to cellulitis or abscess formation. It can also lead to other sequels like it may form a fistula in the subcutaneous tissue or lead to multiple boils. If untreated it can even result in carbuncle formation.[2] On clinical inspection furuncles are red colored; skin around is edematous, hot and sometimes painful to touch. Furuncles may be accompanied with fever or enlarged lymphatic nodes. The major pathogen responsible for recurrent furunculosis is a gram positive rounded bacteria, *Staphylococcus aureus*. It can lead to various skin infections including furunculosis. The commonest site of colonization of *Staphylococcus aureus* is anterior nares.[3] Data suggests that in addition to *Staphylococcus aureus* other bacteria notorious for causing furuncles include Enterococci, *S. epidermidis, Corynebacterium species, S. pyogenes* and *Enterobacteriaceae*. Genetic factors include positive family history and immunological factors include poor hygiene, decreased hemoglobin level, alcohol intake, smoking , diabetes mellitus, obesity etc.[4,5]

Recurrent furunculosis is a challenge for both the patient as well as the dermatologist due to exhausting and prolonged drug treatment. Sometimes the patient may become resistant to antibiotic as a result of intake of multiple antibiotic intake or due to poor compliance of the patient. The most tried regime is CMC regime which contains a skin disinfectant (chlorhexidine), a local nasal antibiotic (mupirocin) and a systemic antibiotic (clindamycin). The affected patient is instructed to rinse with chlorhexidine soap for 21 days once daily, use mupirocin ointment in both nostrils two times daily for a week and take tablet clindamycin 600 mg or 800 mg twice or thrice daily orally for 21 days.[6] In our study, we also asked the patient to apply chlorhexidine soap daily and 2% mupirocin on lesion as well as in nostrils twice daily. We used oral linezolid in place of clindamycin as linezolid showed more encouraging results than clindamycin.[7] To prevent recurrence of furunculosis we added weekly low dose azithromycin in one group[8] and rifampicin in other group.[9] Azithromycin is a broad spectrum macrolide antibiotic. Its mechanism of action is that it binds to 50S ribosomal subunit resulting in inhibition of protein synthesis by blocking the polypeptide, which finally blocks peptide chain extension in the bacteria. It is used to treat STDs like gonorrhea, chlamydia, travelers' diarrhea, respiratory tract infections, skin infections, and atypical pneumonia caused by Mycobacterium avium complex (MAC). Azithromycin in low dose has shown promising results against resistant staphylococcus aureus infection.[10] In contrast rifampicin acts on bacterial DNA dependent RNA polymerase, binds with deep subunit of polymerase and helps to block RNA elongation. Rifampicin is most commonly used as first line treatment for tuberculosis. It has minor side effects at therapeutic dose which include orange, discoloration of urine, sweat and tears.[11] Traditionally Rifampicin is used for the treatment of recurrent furunculosis.[12] That's why in our study, we are comparing efficacy of azithromycin and rifampicin in patients with recurrent furunculosis.

Methods

This prospective research of the suitable value was piloted at the Outpatient Department of Dermatology, DHQ teaching Hospital, Sargodha Medical College Sargodha. Before start of the study institutional review board permission was obtained. The patients with recurrent furunculosis who voluntarily participated in this study were divided into group A and B by using non-probability sampling technique. The participants were guaranteed of privacy and secrecy during the study. In addition, informed written consent was taken. Total 250 patients

aged between 20 and 60 years with history of 3 or more episodes of furunculosis in a year, with clinical evidence of furunculosis were included in the study. Patients with diabetes mellitus, chronic liver failure (CLD), chronic renal failure (CRF), any autoimmune disorder, hyperlipidemia or any other connective tissue disorder were excluded. Patients' name, age, gender, address and mobile number were noted in a pre-designed proforma.

Patients were divided into two groups using random number table, containing 125 patients in each group. Both groups washed affected area of body with chlorhexidine soap daily, applied 2% mupirocin on lesion and in nostrils twice daily and took oral 400-600 mg tablet linezolid twice daily for 10-14 days.[1] In addition, group A was prescribed azithromycin 500mg once weekly for next 3 months (12 weeks)[13] and group B was prescribed rifampicin 450-600mg(10mg/kg body weight) once daily half hour before breakfast for 10 days. The drug is considered efficacious if the patient had no episode of furuncles during the 3-month follow-up after completion of full duration of each treatment. Efficacy of low-dose azithromycin therapy versus rifampicin was shown in in tables and figures. The data collected was processed by using Statistical Package for Social Sciences (SPSS 20).

Results

There were total 250 patients (both male and female) who were selected for this study. Both group A and group B contained 125 patients.

In group A there were 43 (34.4%) males and 82 (65.6%) females and in group B there were 39 (31.2%) males and 86 (68.8%) females **(Table 1)**.

Stratification of age is shown in **Table 2**. 87 (34.8%) patients presented between 21-30 years of age. In group A, total 17 (13.6%) patients reported with recurrent furunculosis. In group **B**, 16 (12.8%) patients reported with recurrent furunculosis **(Table 3,4)**.

Discussion

Recurrent furunculosis is a common dermatological challenge which is quite distressing for the patient as well as the physician. In UK, a study in 2019 suggests that recurrent furunculosis is reported in one in 10 patents.[14]

Table 1 Distribution of patients according to gender.

Gender	*Group A Number (%)*	*Group B Number (%)*
Male	43 (34.4%)	39 (31.2%)
Female	82 (65.6%)	86 (68.8%)

Table 2 Distribution of patients according to age.

Age (years)	*Patients with recurrent furunculosis (%)*
21-30	87 (34.8%)
31-40	76 (30.4%)
41-50	52 (20.8%)
51-60	35 (14%)

Table 3 Patients of Group A on low dose azithromycin with recurrent furunculosis (n=125).

Follow up	*No. of patients with active furunculosis on follow up*			*Total patients with recurrent furunculosis*
	Total	*Male*	*Female*	
1st	5	3	2	5 (4%)
2nd	4	3	1	9 (7.2%)
3rd	2	1	1	11 (8.8%)
4th	0	0	0	11 (8.8%)
5th	2	2	0	13 (10.4%)
6th	4	3	1	17 (13.6%)

Table 4 Number of Patients of Group B on Rifampicin with recurrent furunculosis (n=125).

Follow up	*No. of patients with active furunculosis on follow up*			*Total patients with recurrent furunculosis*
	Total	*Male*	*Female*	
1st	2	2	0	2 (1.6%)
2nd	3	2	1	5 (4%)
3rd	5	3	2	10 (8%)
4th	3	1	2	13 (10.4%)
5th	1	1	0	14 (11.2%)
6th	2	0	2	16 (12.8%)

The treatment of recurrent furunculosis causes psychological as well as financial burden on the patient. The treatment may be prolong due to the resistant nature of *Staphylococcus*, which is the main culprit causing recurrence. It usually occurs in patients with reduced resistance to infection like patients with obesity, diabetes mellitus, blood disorders, immunological diseases etc.

The traditional therapy for treatment of recurrent furunculosis is CMC regime which includes bathing with chlorhexidine soap, applying mupirocin on lesion locally and in nasal cavity and taking antibiotic like clindamycin or linezolid orally. Rifampicin has been advised in patients with recurrent furunculosis. A study was conducted in 2006, in which 80 patients were divided into two groups who were positive for *Staphylococcus aureus* infection on nasal swab. Half of the participants were prescribed rifampicin 400-600 mg daily for 10 days. The study concluded that rifampicin was quite effective to eradicate *Staphylococcus aureus* nasal infection.[9] Azithromycin is a novel drug for use in furunculosis. A recent study conducted in 2020 by our colleagues indicate that it has promising impact to control recurrent furunculosis.[8]

In our recent study we registered 250 patients with recurrent furunculosis. They were divided into group A and group B, both received chlorhexidine soap, mupirocin and linezolid. In addition, group A participants received weekly low dose azithromycin for 3 months and group B participants received rifampicin for 10 days. In group A, 17 patients (13.6%) reported back with recurrent furunculosis whereas 16 patients (12.8%) of group B reported with recurrent furunculosis.

Statistically, on comparison of low dose azithromycin and rifampicin there was no significant difference in effectiveness of the treatment with both regimes.

Conclusion

It is concluded that low dose azithromycin and rifampicin has no statistical difference as far as their clinical efficacy is concerned. Whereas when we take into consideration the duration of treatment, rifampicin has shorter duration of treatment and is less expensive as compared to low dose azithromycin. On other hand, patients who cannot tolerate rifampicin can be given low dose azithromycin as alternative.

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