Journal of Pakistan Association of Dermatologists. 2020; **30(4)**: 662-667.

Original Article

Efficacy of low dose azithromycin in recurrent furunculosis

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Abstract

Aim To access the efficacy of low dose azithromycin in recurrent furunculosis.

Methods This study was conducted at the Outpatient Department of Dermatology, DHQ teaching Hospital, Sargodha Medical College Sargodha, from January 2019 to December 2019. Total 180 patients aged between 20 and 60 years of recurrent furunculosis were divided into two groups. Both groups washed body with chlorhexidine soap daily, applied 2% mupirocin on lesion and in nostrils twice daily and took oral 400mg -600mg tablet linezolid twice daily for 10-14 days. Group A was offered no added treatment but Group B was prescribed azithromycin 500mg once weekly for next 3 months. The drug is considered efficacious if the patient had no episode of furuncles during the 3-month follow-up period of the treatment.

Results In group A, 32 patients (36%) reported back with recurrent furunculosis in contrast with only 9 patients (10%) of group A reported with recurrent furunculosis.

Conclusion It is concluded that low dose azithromycin is far better than patient receiving no treatment for recurrent furunculosis. So, we should consider low dose azithromycin as a promising alternative for treatment of recurrent furunculosis.

Key words
Azithromycin, recurrent furunculosis.

Introduction

A frequent dermatological disease is furunculosis known commonly as boils. A furuncle or boil is an infection of the hair follicle which predominately starts in the root of hair follicle and then spreads in form of subcutaneous abscess or cellulitis. Furuncle can follow different course with time. They may turn into long flat abscess in the subcutaneous tissue taking a phlegmonous form or may develop quite often repeatedly (furunculosis). If untreated these can form a fistulous tract of ingrained abscess between subsequent infected hair follicles and form carbuncle.[1]

If a patient has more than three episodes of furuncles in last one year, the patient is labelled

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to have recurrent furunculosis.[2] The most definitive causative agent is Staphylococcus *aureus* which is mostly colonized in the anterior nares (nostrils) of the patient. The favorite hiding place of *S. aureus* include warm and moist skin folds like axilla, groins, behind the ear etc.[3] Other bacteria related to furuncles include enteric species like *Enterobacteriaceae*, *Enterococci* and *S. epidermidis Corynebacterium species* and *S. pyogenes*.

Clinically, on inspection furuncles are usually red, inflamed and sore swellings of different size sometimes associated with fever or enlarged lymph nodes. Main risk factor for transmission include direct contact with the infected person. Most common predictor of infection is positive family history and additional factor include anemia, poor hygiene and previous history of antibiotic intake, diabetes mellitus, obesity or any other immunological conditions.[4]

The treatment of recurrent furunculosis is quite exhausting and problematic for both the patient as well as the dermatologist. Some dermatologists recommend simple incision and drainage of the single lesion followed by empirical systemic antibiotic therapy sufficient. In case of multiple furuncles with history of recurrence CMC regime is recommended. This CMC regimen involve a skin disinfectant like chlorhexidine with a local nasal antibiotic like mupirocin and systemic antibiotic usually clindamycin. The patient is advised to shower daily with chlorhexidine soap for 21 days, apply mupirocin ointment twice daily for a week in both nostrils and orally takes clindamycin 600 mg or 800 mg twice or thrice daily for 21 days.[5] In our study, we also used chlorhexidine soap daily, 2% mupirocin on lesion and in nostrils twice daily. Instead of clindamycin we used oral linezolid because it showed more promising results than clindamycin.[6] To prevent recurrence of furunculosis we added weekly low dose azithromycin.[7] Azithromycin is a well-known macrolide antibiotic which binds to 50S ribosomal subunit causing inhibition of protein synthesis by blocking the polypeptide, which eventually halts peptide chain prolongation in the bacteria. It is used to treat respiratory tract infections, skin infections, STIs like chlamydia, gonorrhea, travelers' diarrhea and atypical pneumonia caused by Mycobacterium avium complex (MAC). Azithromycin in low dose has shown promising results against resistant staphylococcus aureus infection.[8] So, in our study we related the effects of azithromycin in patients with recurrent furunculosis.

Methodology

This prospective study was conducted at the Outpatient Department of Dermatology, DHQ teaching Hospital, Sargodha Medical College Sargodha. Before initiation of the study institutional review board permission was obtained. The participants were ensured of privacy and secrecy and verbal informed consent was taken from each participant. The patients with recurrent furunculosis who volunteered in this study were categorized by using non-probability sampling technique. Total 180 patients aged between 20 and 60 years with history of 3 or more episodes of furunculosis in a year, with clinical evidence of furunculosis. Patients with diabetes mellitus, chronic liver failure (CLD), chronic renal failure (CRF), any autoimmune disorder, hyperlipidemia or any other connective tissue disorder were excluded. Informed written consent was taken. 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 90 patients in each group. Both groups washed face 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.[2] Group A was not given any added drug but Group B was prescribed azithromycin 500mg once weekly for next 3 months.[7] The drug is considered efficacious if the patient had no episode of furuncles during the 3-month follow-up period of the treatment. Efficacy of low-dose azithromycin therapy 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 180 patients (both male and female) who were selected for this study. Both group A and group B contained 90 patients.

In group A there were 32 (35.56%) males and 58 (64.44%) females and in group B there were 29 (32.22%) males and 61 (67.78%) females (**Table 1)**.

Stratification of age is shown in **Table 2** where out of total 180 patients of recurrent furunculosis majority of patients presented at age between 31-40 years of age 73 (40.56%).

In group A, total number of 32 patients (36%) reported with recurrent furunculosis. In group B, total number of 9 patients (10%) reported with recurrent furunculosis **(Table 3)**.

Table 1 Distribution of patients according to gender

Gender	*Group A Number (%)*	*Group B Number (%)*
Male	32 (35.56%)	29 (32.22%)
Female	58 (64.44%)	61 (67.78%)

Table 2 Distribution of patients according to age

Age (years)	*Number of patients with recurrent furunculosis (%)*
21-30	56 (31.11%)
31-40	73 (40.56%)
41-50	36 (20%)
51-60	15 (8.33%)

Table 3 Number of Patients of Group A with recurrent furunculosis on follow up (n=90)

Group A	*No. of patients with active furunculosis on that follow up*			*Total no. of patients with recurrent furunculosis*	*% of total o. of patients with recurrent furunculosis*
	Total	*Male*	*Female*		
1st follow up	2	0	2	2	2.22
2nd follow up	7	5	2	9	10
3rd follow up	5	2	3	14	16
4th follow up	9	4	5	23	26
5th follow up	4	1	3	27	30
6th follow up	5	3	2	32	36

Table 4 Number of Patients of Group B on low dose azithromycin with recurrent furunculosis on follow up (n=90)

Group B	*No. of patients with active furunculosis on that follow up*			*Total no. of patients with recurrent furunculosis*	*% of total o. of patients with recurrent furunculosis*
	Total	*Male*	*Female*		
1st follow up	2	0	2	2	2.22
2nd follow up	0	0	0	2	2.22
3rd follow up	3	0	2	5	5.56
4th follow up	0	0	0	5	5.56
5th follow up	1	0	1	6	6.67
6th follow up	3	1	2	9	10

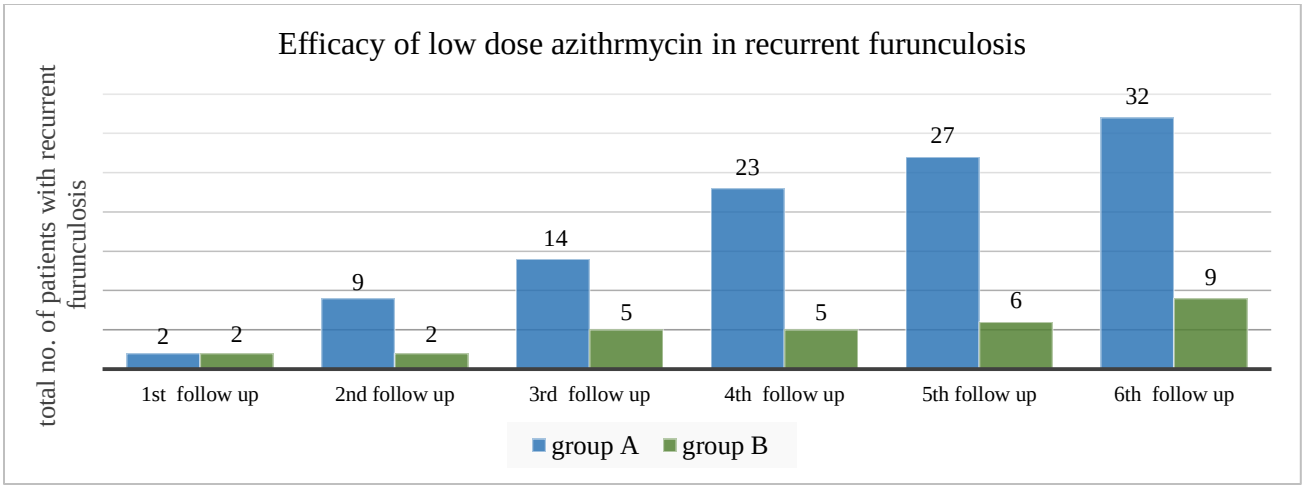

Figure 1 comparison of number of patients with no added treatment (group A) and treatment with low dose azithromycin (group B) n=180

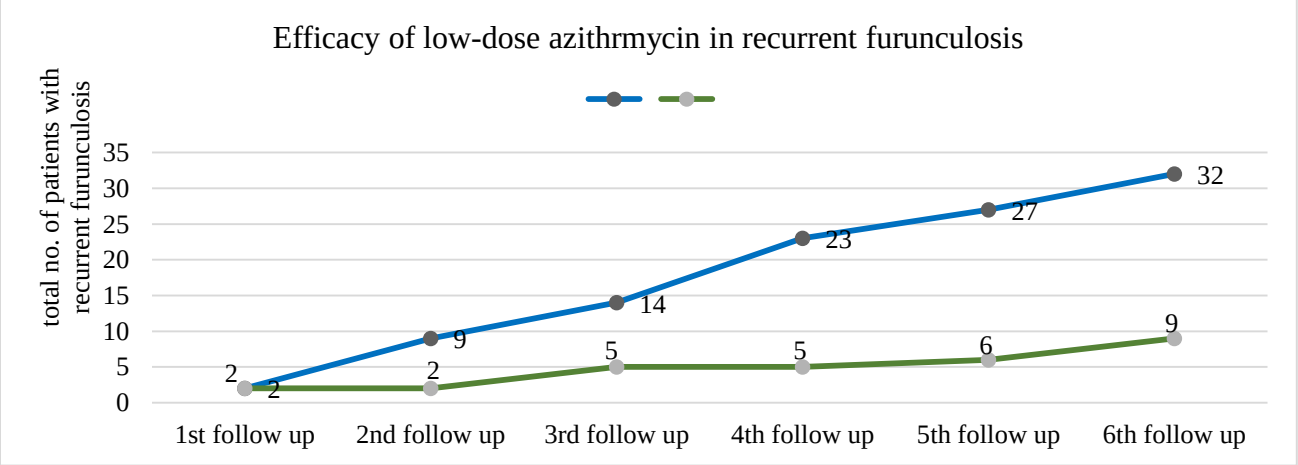

Figure 2 line chart showing number of patients with no added treatment (group A) and treatment with low dose azithromycin (group B) n=180

Discussion

Furunculosis is a frequent complaint of the modern world. The devastating part related to furuncle formation is the recurrence of the disease. According to a study in 2019 by Shallcross *et al*, there is recurrence of furuncle or boil in about ten percent patients at least once a year in UK.[9] Recurrent furunculosis is not only widespread but its treatment is quite costly and required for a longer duration. The major causative agent is staphylococcus aureus which is notorious for its resistance to anti- bacterial therapy. This resilient *S. aureus* bacteria is present in moist and warm areas of skin and in case of recurrent furunculosis the anterior nostrils are its favorite place to hide. Immunodeficiency states which originate in diabetes mellitus, alcoholism, human immunodeficiency virus infection, malnutrition, chronic liver disease, chronic renal disease etc. are more prone to recurrent furunculosis.[10] In a study done in 2010, it was proven that in healthy individuals leukocytes respond well to stimulus by the raised NO and ROS, whereas leukocytes of patients with recurrent furunculosis respond by reduced NO formation on stimulation with NO and ROS.[11]

Figure 3 Patient with recurrent furunculosis

This demonstrates that adequate response by leukocytes are vital to defend skin against recurrent furunculosis.

By definition, when a patients develops furuncles more than two times in a year, it is termed as recurrent furunculosis. The empirical therapy for treatment of recurrent furunculosis is wash with chlorhexidine soap, local mupirocin on lesion and in nostrils and oral antibiotic like clindamycin or linezolid.

Earlier rifampicin was used in patient with recurrent furunculosis to prevent reoccurrence. In similar study nasal swab were taken of 80 participants. The participants with positive S. aureus swab were further divided into two groups. One group was prescribed rifampicin 450-600 mg daily for 10 days and the other were prescribed no treatment. Results revealed that in 10 patients who were not prescribed no treatment remained S. aureus positive whereas patients prescribed rifampicin 10 out of 13 patients were S. aureus negative.[12]

In our study we enrolled 180 participants, who were equally divided into group A and group B. Group A participants were offered no treatment whereas group B participants were prescribed weekly low dose 500mg azithromycin. In group A, 32 patients (36%) reported back with recurrent furunculosis in contrast with only 9 patients (10%) of group A reported with recurrent furunculosis.

Statistically, efficacy of low dose azithromycin is far better than patient receiving no treatment for recurrent furunculosis.

Conclusion

It is concluded that of low dose azithromycin is far better than patient receiving no treatment for recurrent furunculosis. So, we should consider low dose azithromycin as a promising alternative for treatment of recurrent furunculosis.

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