COMPARISON OF ORAL DOXYCYCLINE WITH ORAL MONTELUKAST IN THE TREATMENT OF MODERATE ACNE VULGARIS

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ABSTRACT

Objective: To compare oral Montelukast with oral Doxycycline in the treatment of moderate Acne Vulgaris in terms of mean change in acne severity index.

Study Design: Quasi-experimental study.

Place and Duration of Study: Department of Dermatology, Pak Emirates Military Hospital Rawalpindi, from Mar 2016 to Aug 2016.

Methodology: A total of 84 patients were included in the study. They were randomly assigned to group A and B by consecutive non probability sampling technique. Group A was given 100mg Doxycycline with topical 10% benzoyl peroxide and group B was given 5mg Montelukast with topical 10% benzoyl peroxide. Acne severity index (ASI) was calculated at base line and after one month. Mean change in acne severity index was observed for both the groups.

Results: Independent sample t-test was used to compare the means. Mean post treatment change in acne severity index of group A was 5.45 ± 1.29 and group B was 1.80 ± .59 respectively (*p*-value <0.001). On post stratification analysis for age and gender results were consistent.

Conclusion: Efficacy of Doxycycline is significantly better in terms of mean change in Acne Severity Index, as compared to Montelukast.

Keywords: Acne vulgaris, Acne severity index, Dxycycline, Montelukast.

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INTRODUCTION

Acne Vulgaris is a common chronic skin disease[1]. It is considered a disease of young[2]. The disease persists in half of the patients into their twenties and thirties. It comes early in females than in males. Although often considered a disease of teenagers, it is occurring at an increasingly early age[3]. The papulopustular lesions of acne occur most prominently at skin sites with a high density of sebaceous glands such as the face, back, and chest[4]. The lesions resolve as the age advances but it may cause long standing and detrimental psychosocial effect.

There is great variation among the trials in acne severity assessment and reporting treatment outcomes. Lesion counting, physician global assessment and changes in quality of life are few of the instruments in use[5]. Global Acne Grading System (GAGS)/Acne severity Index is one of the methods commonly suitable to clinical practice[6].

Acne is treated by topical agents like benzoyl peroxide, retinoids and topical antibiotics[7]. Oral antibiotics and oral retinoids can be added in severe cases with poor prognostic factors[8]. Doxycycline is a commonly used antibiotic in moderate to severe Acne Vulgaris[9]. It has anti-inflammatory and antibacterial activity[10]. However its value is compromised by various side effects like gastrointestinal irritation and vaginal candidiasis[10].

To avoid these side effects many alternate products have been tried. Oral Montelukast, an immune-modulator commonly used in allergic disorders, being one of them. Tissue inflammation is an important component of Acne development and progression. Montelukast competes with Leukotriene-B4 for bonding with receptor on target organs. The purpose of this study was

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to compare these two drugs in the treatment of moderate Acne in tertiary care settings.

Rationale of the study was to compare oral Montelukast with oral Doxycycline in the treatment of moderate Acne in terms of mean change in Acne Severity Index.

METHODOLOGY

This quasi-experimental study was carried out in the department of dermatology Pak Emirates Military Hospital Rawalpindi over a period of six months from Mar 2016 to Aug 2016.

WHO calculator was used to calculate the sample size by using results of reference study[9]. A total of 84 patients were recruited through non-probability, consecutive sampling and they were randomly assigned to group A and B. Power of the test was taken as 80% with level of significance as 5%. Patients of 13-23 years age of Both the genders with moderate acne (Acne Severity Index 19-30) were included in the study while patients having history of hyper sensitivity to any of the drugs being used, unreliable follow up severe acne history of polycystic ovary syndrome patients having used any topical or systemic treatment during past 03 months for Acne Vulgaris and patients unwilling to be included in the study were excluded from the study.

After taking approval from hospital ethical committee, 84 patients fulfilling the inclusion criteria were selected through OPD of Department of Dermatology, Pak Emirates Military Hospital Rawalpindi. Informed consent was taken from all the patients. Patients were randomly allocated to group A & B by lottery method. Pre treatment ASI along with contact address of both the groups was recorded. Group A was given 100mg Oral Doxycycline once per day with 10% Benzyl Peroxide and group B was given 5mg Oral Montelukast with 10% Benzyl Peroxide over a period of one month. Post treatment ASI of both the groups was recorded by researcher on completion of one month of treatment. All the data was entered into a specially designed proforma.

Data was analyzed using SPSS version 21.0. For quantitative variables like age and Acne Severity index, mean ± SD were calculated. For qualitative variables like gender, frequency and percentages were calculated. Paired sample t-test was used to compare the pre and post treatment acne severity index using 5% level of significance. Effect modifiers like age and genders were controlled using stratification. Independent sample post stratification t-test was used to calculate the *p*-value. The *p*-value ≤0.05 was taken as significant.

RESULTS

Out of the 84 patients, group A had 6 (14.3%) males and 36 (85.7%) females. Group B had 9 (21.4%) males and 33 (78.6%) females. Mean age of the patients in group-A was 19.61 ± 3.90 years and in group B was 20.90 ± 4.44 years. Stratification for age and gender was carried out.

Table-I: Acne Severity Index (ASI) (n-84).

Group	Acne Severity Index		Change in Acne Severity Index	*p*-value
	Pre Treatment	Post Treatment		
A (Doxycyline)	Mean ± SD	Mean ± SD	Mean ± SD	<0.001
	26.81 ± 2.03	21.35 ± 1.65	5.45 ± 1.29	
B (Montelukast)	25.80 ± 2.53	24 ± 2.77	1.80 ± 0.59	

Table–II: Stratification for age and gender.

Group	Age (years)	Acne Severity Index Mean ± SD	Gender	Acne Severity Index Mean ± SD	*p*-value
A (Doxy)	10-20	5.39 ± 1.37	Male	4.33 ± 1.21	<0.001
B (Monte)		1.70 ± 0.58	Female	5.63 ± 1.22	
A (Doxy)	21-30	5.57 ± 1.15	Male	1.77 ± 0.66	<0.001
B (Monte)		1.83 ± 0.61	Female	1.81 ± 0.58	

Mean pre treatment and post treatment ASI along with post treatment change in ASI are presented in table-I. Mean change in post treatment Acne Severity Index (ASI) was 5.45 ± 1.29 and 1.80 ± 0.59 (p<0.001) in group A and B respectively. Post stratification analysis with regards to age and gender is presented in table-II.

DISCUSSION

Acne vulgaris is a multifactorial disease. Acne can be treated in various ways. Anti-inflammatory and antibacterial drugs are mainstays of treatment in moderate to severe disease[11-13]. Oral antibiotics have been used in the treatment of Acnc Vulgaris since decades. Out of many antibiotic groups, Tetracyclines are mainly used in treatment of Acne Vulgaris. Seventy six percent antibiotic prescriptions were written for Tetracyclines in the treatment of Acne Vulgaris in 2011 by US Dermatologists[13].

Doxycycline is a gold standard drug in treatment of Acne[14]. It was approved in 1967 by FDA for treatment of Acne Vulgaris after multiple publications confirmed its efficacy[15]. Increased lipophilicity and less frequent dosing make it the leading antibiotic choice in Acne patients[16]. While presenting data at Scientific Panel for Antibiotic Use in Dermatology (SPAUD) in 2014 Sanchez claimed that 43% prescriptions in US included Dxoycycline as antibiotic[17]. Acne Severity Index showed significant change in our patients after one month of treatment confirming its efficacy in line with international data.

Antibiotics are usually used for a short period in other cutaneous infections like boils and abscesses. However in Acne Vulgaris, treatment with antibiotics is prolonged[18]. This prolonged therapy is compromised by various side effects of these drugs. Tetracyclines are known for their photosensitivity and vestibular side effects[19].

Doxycycline has gastrointestinal side effects such as esophagitis and dose related phtotosensitivity[20]. In our study 4% (n-2) of patients in group A reported mild nausea and retrosternal burning. One of the two patients, a 26 years old girl was obese already taking antiulcer treatment. James *et al* in their study published in May 2015 reported that these side effects can be minimized by using enteric coated formulations and observing other precautions like taking the drug with fatty meals[21].

Various alternatives have been tested because of these side effects. Azithromycin and Minocycline have been compared frequently. Zouboulis *et al*[22] published a study in 2009 investigating Ziluoton as an alternative drug in the treatment of acne. Kirick LH[19] in November 2010 compared Minocycline and Doxycycline for efficacy and safety in treatment of Acne. Ullah *et al*[20] from Lady Reading Hospital, Peshawar Pakistan compared Azithromycin against Doxycycline in 2014 in treatment of Acne.

Montelukast, was tested in the treatment of Acne Vulgaris by Behrangi *et al* in a recent study published in Journal of Research in Medical Sciences from Iran. Authors concluded that both the medications were effective and there was no significant difference across the groups in terms of efficacy.

In our study although Montelukast showed good results in terms of decrease in mean ASI from base line indicating its effectiveness in treatment of acne, Doxycycline was far better in efficacy and the difference in efficacy of the drugs was statistically significant. This was in contrast with the reference study, which showed no statistically significant difference between the two. One reason for this difference could be the longer follow up in the reference study.

Despite extensive search we couldn't find any other local or international study reporting short or long term comparison of these two drugs supporting our claim. Headache, abdominal pain and bleeding tendency are few of the side effects reported with Montelukast use. We couldn't clearly establish any of these effects in the patients in Montelukast group. In this aspect our findings were same as of the reference study that Montelukast is better in terms of side effects in Acne treatment.

The limitation of study was short duration of follow up. Treatment of acne is usually prolonged. So studies with longer follow ups are suggested to establish the long term effects of these drugs.

CONCLUSION

Efficacy of Doxycycline is significantly better in terms of mean change in Acne Severity Index, as compared to Montelukast.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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