IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 22, Issue 12 Ser.8 (December. 2023), PP 35-38
www.iosrjournals.org

A Comparative Study of Azithromycin Pulse Therapy and Minocyclin in Acne Vulgaris

Samina Sharmin[1], A K M Monzur Morshed[2], Md Abdul Wahab[3], Mst. Farhana Yasmin[4]

[1]*Graded Specialist, Department of Dermatology and Venereology, Combined Military Hospital (CMH), Saidpur, Bangladesh*
[2]*Graded Specialist, Department of Ophthalmology, Combined Military Hospital(CMH), Saidpur, Bangladesh*
[3]*Commanding Officer, Combined Military Hospital (CMH), Saidpur, Bangladesh*
[4]*Phase B (Resident), Department of Paediatrics, Bangladesh Shishu Hospital, Dhaka, Bangladesh*

ABSTRACT
Background: *An often-occurring dermatological issue is acne vulgaris. Usually, Propionibacterium acnes is the reason. Minocycline is a recently developed medication used to treat acne vulgaris. However, it is believed that azithromycin, which has a lengthy half-life, can treat acne vulgaris more effectively and with better adherence.* ***Objective:*** *This study compared the safety and effectiveness of minocycline and azithromycin pulse therapy in treating acne vulgaris.*
Methods: *This study was carried out in the Department of Dermatology and Venereology, Combined Military Hospital (CMH), Saidpur, Bangladesh, during the period from January 2021 to December 2021 and was prospective. The trial cohort comprised 90 patients with moderate-to-moderately severe (Grades II and III) acne vulgaris. The two treatment groups, group A (45) and group B (45), were randomly assigned to the patients. Patients in group B received 50 mg minocycline twice a day and 0.05% topical tretinoin for four months, while patients in group A received 500 mg azithromycin once daily for three days per week as pulse treatment. The MS Office program and SPSS version 23.0 were used to process, analyze, and distribute the data.*
Results: *In this study, group A (Azithromycin) had a significant connection (P=0.022) between the baseline and final score distribution, with most of the group female. However, we discovered no meaningful correlation in group B (P=0.072). We found a significant correlation (P=0.002) between the groups in the final assessment.*
Conclusion: *This study found the efficacy of both azithromycin pulse therapy and minocycline satisfactory. However, per the safety profile findings, minocycline is safer than azithromycin pulse therapy in treating acne vulgaris.*

Keywords: *Acne vulgaris, Azithromycin, Pulse therapy, Minocycline, Efficacy, Safety*

Date of Submission: 21-12-2023 Date of Acceptance: 31-12-2023

I. INTRODUCTION

One of the most prevalent cutaneous conditions affecting teenagers and young adults is acne vulgaris. It is the eighth most common disease globally, projected to impact 9.4% of the population worldwide[1]. The cumulative incidence of acne in males and females during adolescence is 91% and 79%, respectively, and reduces to 3% and 12% in males and females during adulthood[2]. These patients may have severe facial pigmentation and scarring, which can result in psychological morbidities such as anxiety, sadness, or suicidal thoughts. These symptoms might compromise the affected people's social and professional lives[1].

About 85% of adolescents have acne, which manifests earlier in females than in males. Even though acne is typically associated with teenagers, it can also affect younger people[3]. Genetic, hormonal, nutritional, and environmental variables are among the many endogenous and exogenous factors that contribute to the development of acne[4]. These elements interact in a complicated way, triggering innate and cellular immune responses. Although the precise pathophysiology is unknown, the key underlying mechanisms are altered Propionibacterium acnes colonization, hyperproliferation of keratinocytes, increased sebum production, and inflammation[5].

Over the past 40 years, antibiotics have been widely regarded as an essential component of acne care; yet, acne vulgaris is not an infection in the traditional sense[6]. The reversible binding of azithromycin to the bacterial cell's 50S ribosomal subunit has been linked to its antibacterial action, which inhibits protein synthesis[7]. However, compared to doxycycline, minocycline, a semi-synthetic second-generation tetracycline,

has a better pharmacokinetic profile and is not phototoxic[8]. Because it is lipophilic, minocycline is considered a more effective acne treatment than doxycycline because it achieves a greater tissue concentration[9].

Minocycline is a recently developed medication for the treatment of acne vulgaris. However, it is believed that azithromycin, which has a lengthy half-life, can be more successful and better complied with when treating acne vulgaris[10].

II. METHODOLOGY & MATERIALS

This was a prospective, comparative study and was conducted in the Department of Dermatology and Venereology, Combined Military Hospital (CMH), Saidpur, Bangladesh, during the period from January 2021 to December 2021. In total 90 patients with moderate-to-moderately severe (Grade II and III), acne vulgaris were included in the study population.

Two treatment groups were assigned at random to the patients. Forty-five patients in Group A received 500 mg azithromycin once daily for three days a week as pulse treatment in addition to 0.05% topical tretinoin for four months, while 45 patients in Group B received 50 mg minocycline twice daily in addition to 0.05% topical tretinoin for four months.

Participants in this study ranged in age from 15 to 40 years old, and both genders were represented in the study group. The study's exclusion criteria included the following: patients with chronic underlying diseases, cases with known hypersensitivity to the study drug, cases taking topical treatment within the last two weeks, cases using systemic antibiotics within the previous three weeks, and cases involving pregnant or lactating mothers.

Before data collection, all participants provided their appropriate written consent. Every required piece of information was gathered using a pre-made questionnaire. Age, sex, relationship to the menstrual cycle, lesion length, lesion location, and other characteristics were noted. According to requirements, all data were gathered, handled, examined, and shared using MS Office and SPSS version 23.0.

Adityan (2009)[11] states that a basic grading method was used to evaluate acne vulgaris, with consideration given to the prominent lesion. According to that system of grading, Grade 1 consisted of comedones and infrequent small cysts that were limited to the face; Grade 2 consisted of comedones with infrequent pustules and small cysts that were limited to the face; Grade 3 consisted of numerous comedones and large and small inflammatory papules and pustules that were more widespread but still limited to the face, and Grade 4 consisted of multiple comedones and deep lesions that involved the face and upper parts of the trunk. In addition, "Grade Zero"—defined as the absence of lesions—was employed in this investigation at the conclusion of treatment and during follow-up.

III. RESULTS

In this study, analyzing the gender of the participants, we observed in group A, 40% of participants were male and 60% were female whereas in group B, 42.22% of participants were male and 57.78% were female. So, in both the group's females were dominating in number.

Table 1: Demographic characteristics of the study population (N=90)

Variables	**Group A (45)**		**Group B (45)**	
Age (year)	n	%	n	%
15-20	12	26.67	13	28.88
21-25	20	44.44	22	48.88
26-30	7	15.55	6	13.33
31-40	6	13.33	4	8.88
Sex				
Male	18	40	19	42.22
Female	27	60	26	57.78

In group A, the highest number of patients was found from 21-25 year's age group which was 44.44%. Then 26.67% were from 15-20 years age group. On the other hand, in group B, the highest number of patients was also found from 21-25 year's age group and it was 48.88%.

Severity score of acne from baseline to final assessment stages among the participants of both groups we observed, in group A at baseline 15.55%, 35.55%, and 40% participants had the score point 2, 3 and 4 respectively whereas in final stage 62.22%, 26.66%, and 11.11% participants had the score point 1, 2 and 3 respectively. In group A between baseline and final score distribution, we found a significant correlation where the P value was 0.022.

Table 2: Severity score distribution between baseline and final assessment (N=90)

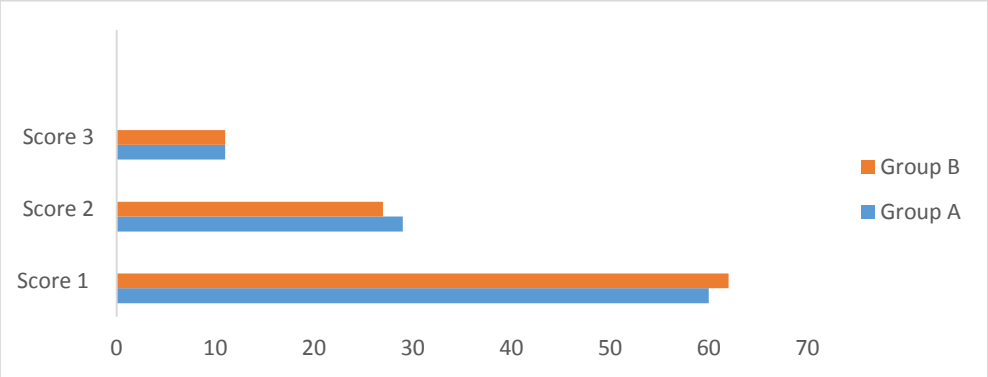
Score	Group A (45)				Group B (45)			
	Baseline		Final		Baseline		Final	
	n	%	n	%	n	%	n	%
1	0	0	28	62.22	0	0	29	64.44
2	7	15.55	12	26.66	5	11.11	11	24.44
3	16	35.55	5	11.11	17	37.77	5	11.11
4	18	40	0	0	21	46.66	0	0
P value	**0.022**				**0.072**			

On the other hand, in group B at baseline 11.11%, 37.77%, and 46.66% of participants had the score points 2, 3, and 4 respectively whereas in the final stage 64.44%, 24.44%, and 11.11% of participants had the score point 1, 2 and 3 respectively. In group B between baseline and final score distribution, the P value was found 0.072.

Table 3: Severity score comparison between the groups in the evaluation stage (N=90)

Score	Group A (45)		Group B (45)	
	Final		Final	
	n	%	n	%
1	27	60	28	62.22
2	13	28.88	12	26.66
3	5	11.11	5	11.11
4	0		0	
P value	**0.002**			

Figure 1: Bar chart showed Patients group wise Severity Score



In this study, in severity score comparison between the groups in the evaluation stage we observed, in group A at 60%, 28.88%, and 11.11% participants had the score point 1, 2, and 3 respectively whereas in group B 62.22%, 26.66%, and 11.11% participants had the score point 1, 2 and 3 respectively. In this final assessment, we found a significant correlation between the groups (P=0.002).

Table 4: Distribution of adverse events among patients of both groups (N=90)

Adverse effects	Group A		Group B	
	n	%	n	%
Nausea	11	24.44	8	17.77
Diarrhea	5	11.11	4	8.88
Epigastric pain	4	8.88	2	4.44
P value	**0.323**			

In analyzing the adverse event during the treatment tenure, in group A among 24.44%, 11.11% and 8.88% cases of nausea, diarrhea and epigastric pain had been found respectively. However, in group B among 17.77%, 8.88%, and 4.44% cases of nausea, diarrhea and epigastric pain had been found respectively. Regarding the adverse events between both the groups, we found a significant correlation where the P value was 0.323.

IV. DISCUSSION

Although Azithromycin is predominantly a bacteriostatic medication, it may also have bactericidal effects at larger dosages. Azithromycin side effects that are most frequently associated with treatment include nausea, diarrhea, and cramping in the abdomen[12]. However, Minocycline, a second-generation, semi-synthetic tetracycline, has a superior pharmacokinetic profile than doxycycline and is not phototoxic[13].

Analyzing the adverse events that occurred throughout treatment, it was discovered that 24.44%, 11.11%, and 8.88% of cases of nausea, diarrhea, and epigastric discomfort, respectively, had occurred in group A. Nonetheless, incidences of nausea, diarrhea, and epigastric pain were discovered in 17.77%, 8.88%, and 4.44% of group B participants, respectively. We found a significant association for the unfavorable incidents that occurred in both groups (P = 0.323). Concerning the unfortunate incidents in both groups, we discovered a vital link with a P value greater than 0.05. Vertigo, nausea, and moderate dizziness are the side effects of Minocycline that are most frequently reported[14].

Azithromycin was administered as a single oral dose (500 mg/day) for four days in four cycles, while Minocycline was given 100 mg daily for six weeks every ten days[15]. We discovered a significant connection with a P value of 0.022 between the baseline and final score distribution in study group A (Azithromycin). In contrast, the P value in group B between the baseline and final score distribution was determined to be 0.072. In this study, we observed that, when comparing the severity scores of the groups in the evaluation stage, participants in group A had scores of 1, 2, and 3 at 62.22%, 26.66%, and 11.11%, respectively. In comparison, participants in group B had scores of 64.44%, 24.44%, and 11.11%, respectively. In this final assessment, we found a significant correlation between the groups (P=0.002).

According to a study, Azithromycin is a long-acting medication that can be used once every three days, giving it the most significant advantage over other systemic antibacterial agents in treating acne vulgaris[16]. In addition, after four weeks of treatment, Federico reported[17] an excellent response of 90.4% to Azithromycin, marginally higher than Singhi's[18] response of 70.25%. However, when Gruber et al.[19] examined Minocycline with Azithromycin, they found that both medications had an excellent clinical response (70–75%).

V. CONCLUSION

The effectiveness of minocycline and azithromycin pulse treatment was satisfactory in this investigation. We can conclude that while treating acne vulgaris, minocycline is a safer option than azithromycin pulse treatment. However, most patients in the azithromycin receiving group had consented to patient compliance with azithromycin pulse therapy. We would suggest doing similar additional experiments with larger-sized samples in multiple locations to obtain more precise results.

REFERENCES

[1]. Lukaviciute L, Navickas P, Navickas A, Grigaitiene J, Gancevi-Ciene R, Zouboulis C. Quality Of Life, Anxiety Prevalence, Dep-Ression Symptomatology And Suicidal Ideation Among Acne Patients In Lithuania. J Eur Acad Dermatol Venereol 2017; 31(11):1900–6.

[2]. Semyonov L. Acne As A Public Health Problem. Ital J Public Health 2010; 7(2):112-4.

[3]. Alshamrani Hm, Alsolami Ma, Alshehri Am, Salman Ak, Alharbi Mw, Alzuhayri Aj, Et Al. Pattern Of Skin Diseases In A University Hospital In Jeddah, Saudi Arabia: Age And Sex Distribution. Ann Saudi Med 2019; 39(1):22–8.

[4]. O'neill Am, Gallo Rl. Host-Microbiome Interactions And Recent Progress Into Understanding The Biology Of Acne Vulga-Ris. Microbiome 2018;6(1): 177-93.

[5]. Das S, Reynolds Rv. Recent Advances In Acne Pathogenesis: Im-Plications For Therapy. Am J Clin Dermatol 2014; 15(6): 479-88

[6]. Ozolins, M., Eady, E. A., Avery, A. J., Cunliffe, W. J., Po, A. L. W., O'neill, C., ... & Williams, H. C. (2004). Comparison Of Five Antimicrobial Regimens For Treatment Of Mild To Moderate Inflammatory Facial Acne Vulgaris In The Community: Randomised Controlled Trial. The Lancet, 364(9452), 2188-2195.

[7]. Bataille, V., Snieder, H., Macgregor, A. J., Sasieni, P., & Spector, T. D. (2002). The Influence Of Genetics And Environmental Factors In The Pathogenesis Of Acne: A Twin Study Of Acne In Women. Journal Of Investigative Dermatology, 119(6), 1317-1322.

[8]. Garrido- Mesa, N., Zarzuelo, A., & Gálvez, J. (2013). Minocycline: Far Beyond An Antibiotic. British Journal Of Pharmacology, 169(2), 337-352.

[9]. Sardesai, V. R., & Deka, Y. T. (2017). Comparison Of Efficacy Of Oral Azithromycin With Oral Minocycline In The Treatment Of Acne Vulgaris. Clinical Dermatology Review, 1(2), 37.

[10]. Sumsuzzoha, Dr.S.M. Et Al. (2022) 'A Comparative Study Of Azithromycin Pulse Therapy With Minocycline In Acne Vulgaris', Saudi Journal Of Medicine, 7(12), Pp. 610–615. Doi:10.36348/Sjm.2022.V07i12.002.

[11]. Adityan, B., Kumari, R., & Thappa, D. (2009). Scoring Systems In Acne Vulgaris. Indian Journal Of Dermatology, Venereology And Leprology, 75(3), 323-326.

[12]. Garrido- Mesa, N., Zarzuelo, A., & Gálvez, J. (2013). Minocycline: Far Beyond An Antibiotic. British Journal Of Pharmacology, 169(2), 337-352.

[13]. Kubba, R., Bajaj, A. K., Thappa, D. M., Sharma, R., Vedamurthy, M., & Dhar, S. (2009). Acne In India: Guidelines For Management-Iaa Consensus Document. Clinical Features. Indian J Dermatol Venereol Leprol, 75, 13-25.

[14]. Rosso, J. Q. (2008). What Is The Role Of Benzoyl Peroxide Cleansers In Acne Management? Do They Decrease Propionibacterium Acnes Counts? Do They Reduce Acne Lesions? J Clin Aesthetic Dermatol, 1, 48-51.

[15]. Gruber, F., Grubišić-Greblo, H., Kaštelan, M., Brajac, I., Lenković, M., & Zamolo, G. (1998). Azithromycin Compared With Minocycline In The Treatment Of Acne Comedonica And Papulopustulosa. Journal Of Chemotherapy, 10(6), 469- 473.

[16]. Sharma, S., Kumar, P., Banjare, S., & Jain, S. K. (2014). Efficacy Of Azithromycin Pulse Therapy In Acne Vulgaris Treatment: A Hospital Based Study. International Journal Of Scientific Study, 1(4), 21- 23.

[17]. Lalak, N. J., & Morris, D. L. (1993). Azithromycin Clinical Pharmacokinetics. Clin Pharmacokinet, 25, 370- 4.

[18]. Singhi, M. K., Ghiya, B. C., & Dhabhai, R. K. (2003). Comparison Of Oral Azithromycin Pulse With Daily Doxycycline In The Treatment Of Acne Vulgaris. Indian J Dermatol Venereol Leprol, 69, 274-6.

[19]. Gruber, F., Grubišić-Greblo, H., Kaštelan, M., Brajac, I., Lenković, M., & Zamolo, G. (1998). Azithromycin Compared With Minocycline In The Treatment Of Acne Comedonica And Papulopustulosa. Journal Of Chemotherapy, 10(6), 469- 473