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Efficacy of Oral Zinc Sulphate in Patients of Acne Vulgaris

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ABSTRACT

Acne is a chronic condition that affects pilosebaceous units, which manifest as either inflammatory or non-inflammatory lesions. **Objective:** To determine the efficacy of oral zinc sulphate in patients with acne vulgaris. **Methods:** An observational study was held at the OPD Department of Dermatology, Jinnah Hospital-Lahore, Pakistan, which enrolled 93 patients.The Global Acne Grading System was used to evaluate acne severity. These patients were given oral zinc sulphate 220mg twice a day for 3 months. Efficacy of treatment was labelled if there was ≥50% reduction in the baseline GAGS score at the end of 3 months of treatment.All the data were processed by SPSS version 26.0.Frequency and percentages were used for categorical parameters.The chi-square test was applied, in which a p-value<0.05 was considered significant. **Results:** It involved cheeks and nose in 26 (28.0%) patients, followed by forehead and chin in 23 (24.7%) patients. Efficacy of treatment was observed in 53 (57.0%) patients. An insignificant difference in the frequency of efficacy across various subgroups was observed. The percent reduction in mean GAGS score from baseline ranged from 25.0% to 75.0%, with a mean of 51.2 ± 11.9%, with a significant p-value of 0.001*.There was a statistically insignificant difference in the frequency of efficacy across various subgroups based on patients' age, gender and severity (p-value=0.870) of disease and baseline GAGS score (p-value=0.993). **Conclusions:** It was concluded that almost 57% of patients with mild to moderate acne showed improvement in their disease progression with oral zinc sulphate treatment. It was cost-effective with easy availability.

INTRODUCTION

A frequent medical condition that causes skin irritation and leads to social and psychological misery is acne vulgaris (AV). Its patho-physiology includes colonization of sebaceous glands with Cutibacterium Acne and excessive sebum production as revealed by the literature review [1, 2]. Sebaceous glands are activated by low Vitamin-D levels and testosterone production, as previously documented [1]. Numerous earlier investigations have shown that these elements offer a lipid-rich, anaerobic environment that is conducive to the growth of Cutibacterium Acne [3, 4]. Thus, sebaceous follicles grow into pimples due to a favourable environment that primarily affects the victims' face, chest and back [5]. This condition affects both sexes and arises following the pubertal spurt, when sebum production increases as a result of altered serum levels of sexual hormones [6]. The primary cause of this illness is the growth of Propionibacterium acnes, which causes local inflammation and the development of pustules. Erythema, post-inflammatory hyperpigmentation (PIH) and scarring are among the known side effects that can occur [7, 8]. The aforementioned consequences make victims' lives difficult and gloomy, therefore, they turn to doctors and other

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health care professionals for guidance and treatment. Although it can be mild, moderate, or severe, the literature review reported that 15-20% of adults worldwide will experience moderate acne at some point in their lives [9, 10]. Among various treatment options, zinc has shown promising results in patients with acne vulgaris. Zinc is easily available, and its use is associated with few side effects. Hence, it can be used as an alternative treatment option. Zinc promotes natural killer cells and complement activation [11-13]. Acne is a global health issue with the highest prevalence at puberty, affecting both genders, especially female. Acne of any grade affects its victim psychologically, thus, the rationale of the present study was to address the efficacy of oral zinc sulphate in patients of mild to moderate acne vulgaris. Due to a lack of local data regarding acne treatment with oral zinc in our culture, the results of the present study will add literature and knowledge regarding this health issue. Most previous international studies covered the role of retinoic acid in acne, but lacked the role of oral zinc sulphate in patients with mild to moderate acne.

This study aims to determine the efficacy of oral zinc sulphate in patients with acne vulgaris.

METHODS

An observational study was conducted at the Outpatient Department (OPD) of the Dermatology Department, Jinnah Hospital-Lahore, Pakistan, that enrolled 93 patients through randomized sampling technique by keeping a 95% confidence level, a 10.0% margin of error, and taking the expected frequency of efficacy, i.e. 59.5% [10]. After taking the ethical approval, the study duration was September 2020 to December 2020 (CPSP/REU/DER-2017-005-860). After informed consent, history was taken, and a physical examination was done. Severity of acne was calculated by the Global Acne Grading System (GAGS) score. Digital photographs were taken before the start of treatment. Patients were given oral zinc sulphate 220 mg twice a day for three months. A monthly follow-up was done to assess the response to treatment. Scoring was done at the end of three months and entered in the proforma. Males and unmarried females between 18-30 years having diagnosed acne (mild to moderate) were included. Individuals suffering from any critical illness or taken vitamin D supplements before the start of treatment were ruled out. All the data were processed by SPSS version 26.0. Mean ± SD was used for quantitative variables, while categorical variables (gender and site of involvement, and efficacy) were described as frequencies and percentages. Post-stratification Chi square test for categorical parameters was used to see the statistical significance in efficacy of oral zinc pre and post treatment, depicted by p-value≤0.05, taken as significant. A paired t-test was used to see the difference in GAGs score both pre- and post-treatment.

RESULTS

Distribution among the enrolled 93 patients for gender, age, severity of disease, site of acne AND efficacy was presented. Mean ± SD for age was 21.5 ± 2.7 years (Table 1).

Table 1: Baseline Information Regarding Enrolled Patients (n=93)

Variables	Frequency (%)
Genders	
Males	42 (45.2%)
Females	51 (54.8%)
Age Groups (Years)	
18-24	79 (84.1%)
25-30	15 (15.9%)
Severity of Disease	
Mild	59 (64.4%)
Moderate	34 (36.6%)
Site of Acne	
Forehead	23 (24.7%)
Cheeks and Nose	26 (28%)
Chin	23 (24.7%)
Chest and Upper Back	21 (22.6%)
Efficacy	
Yes	53 (57%)
No	40 (43%)

The GAGS score ranged from 4 to 29 at baseline, with a mean of 16.0 ± 7.1. It decreased significantly after oral zinc sulphate treatment. The percent reduction in mean GAGS score from baseline ranged from 25.0% to 75.0% with a mean of 7.8 ± 3.9% (Table 2).

Table 2: Description of GAGS Score Among Acne Patients at Various Time Stamps

Time Stamp	GAG Score (Mean ± SD)	p-value
At Baseline	16.0 ± 7.1	0.001*
After Treatment	7.8 ± 3.9	
Change	8.2 ± 4.2	

*Statistically Significant

There was no statistically significant difference in the frequency of efficacy across various subgroups based on patient's age, gender and severity (p-value=0.870) of disease and baseline GAGS score (p-value=0.993). This insignificance may be due to small sample size or other confounding factors like duration of disease and severity or compliance with treatment (Table 3).

Table 3: Efficacy of Oral Zinc Sulphate in Treatment of Acne Patients (n=93)

Subgroups		Frequency	Efficacy n (%)	p-value
Age (Years)	18-24	79	45 (57.0%)	0.990
	25-30	14	8 (57.1%)	
Gender	Male	42	24 (57.1%)	0.978
	Female	51	29 (56.9%)	

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Severity of Disease	Mild	59	34 (57.6%)	0.870
	Moderate	34	19 (55.9%)	
Baseline GAGS Score	4-12	33	19 (57.6%)	0.993
	13-20	35	20 (57.1%)	
	21-29	25	14 (56.0%)	

DISCUSSION

Zinc supplements are essential for enhancing the immune system of every individual, as reported previously. Sebocytes and keratinocytes grow as a result, thus resulting in their proliferation and differentiation [14]. It works by binding to its receptors while producing its antioxidant and anti-comedogenic actions. In the current study, there were 93 enrolled patients, while females were in the majority. Although there were fewer patients (n=68) in one earlier study [14], the majority of them were female. Present findings were consistent with another earlier study that found a similar female preponderance among acne patients who presented at Ziauddin Medical University Hospital in Karachi, with a male to female ratio of 1:1.2 [15]. Therefore, our study's enrollment was consistent with the earlier study. In the present study, the mean age of the acne patients was 21.5 ± 2.7 years. One researcher has reported that the mean age of patients presenting with acne at Jinnah Postgraduate Medical Centre, Karachi, was 21 ± 3.9 years [16]. A similar mean age of 22.4 ± 5.2 years has been reported among Bangladeshi patients with acne [17]. Thus mean age of participants in the current study was in line with many previous studies. Present results showed that 59 (63.4%) patients had mild acne while 34 (36.6%) had moderate acne. One previous study showed a similar frequency of mild and moderate acne to be 77.0% and 23.0%, respectively [18]. One more study reported a similar distribution of mild (60.0%) and moderate (40.0%) acne in Indian patients [19]. The efficacy of treatment with oral zinc sulphate in our study was seen in 57.0% of patients. Insignificant difference in the frequency of efficacy across various subgroups based on different parameters and baseline GAGs score (p-value=0.993). The present observation was in line with the previously published research, which reported that oral zinc sulphate treatment resulted in ≥50% improvement in baseline GAGS score among 59.5% of their acne patients [20]. In the present study, mild to moderate acne improved in response to oral zinc treatment and showed high efficacy when applied to mild acne.

CONCLUSIONS

It was concluded that almost 57% of patients with mild to moderate acne showed improvement in their disease progression with oral zinc sulphate treatment. It was cost-effective with easy availability. Thus, it can be used as a treatment option for mild to moderate acne, although more studies with larger sample sizes and a side effect profile are recommended.

Authors Contribution

Conceptualization: MJ
Methodology: MJ, RM, MQ, TR
Formal analysis: RM, WN
Writing review and editing: AA
All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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