Original Article

Efficacy of Evening Primrose Oil in Treatment of Atopic Dermatitis

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ABSTRACT

Objective: To find out efficacy of evening primrose oil in treatment of atopic dermatitis.
Study Design: Randomized controlled clinical trial
Place and Duration of Study: This study was conducted at the department of dermatology Mian Rashid Hussain Memorial Hospital Pabbi, Nowshera and Alkhidmat hospital Peshawar for duration of six months from November 2020 to April 2021.
Materials and Methods: Totally, 300 patients were included in the study. Each primrose oil and control group comprise of 150 patients. All the information was recorded at the baseline and each following visit for five months.
Results: All mean values in the evening primrose oil group have gradually and continuously decreased on their 5 successive monthly evaluations in comparison to the baseline values. Intensity and itchiness ratings also declined significantly. In contrast, the average results in the control group have been delayed, less pronounced and uneven. Overall, at the completion of the 5th month, improvement was observed in 147 (98 %) in EPO and 40 (60 %) in control group patients. At any stage of evaluation in either group no major adverse effects were recorded.
Conclusion: Our study concludes that evening primrose oil is effective and safe for the management of atopic dermatitis.
Key Words: Evening primrose oil, Atopic dermatitis, Linoleic acid

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INTRODUCTION

Atopic dermatitis (AD) is inflammatory, recurring chronic skin condition. In this problem trans-epidermal water loss increases along with erythema, skin dryness and itching [1, 2]. AD is heterogeneous and characterized by complex immunologic aberrant responses, which include degradation of epidermal barrier, hereditary factors, and climatic influences. According to several studies, AD may be linked to irregular metabolism of fatty acid, particularly inappropriate gamma-linolenic acid (GLA) synthesis [3-5].

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The functional impairment of delta-6 desaturase has been suggested as a risk factor for AD in certain AD patient groups [6, 7]. The diagnosis is confirmed primarily on physical examination, and the Hanifin and Rajka criteria are the most frequently employed criteria[8]. This illness often starts in childhood, affects both males and females, and has been gradually increasing in frequency over the last several years[9]. It is critical for these individuals to avoid documented precipitating or exacerbating variables such as extreme temperatures, frequent washing and scrubbing of the skin, stress and anxiety, contact irritants, and aeroallergens. Apart from this, an elimination diet trial, skin hydration with a bathing accompanied by emollients application, needful use of antihistaminics and antibiotics, topically use of glucocorticoids, and tacrolimus constitute the first line of treatment for AD. In severe instances, second-line therapies may include phototherapy, photo-chemotherapy. The natural source of linoleic acid (LA) and gamma linolenic acid (GLA) is considered as evening primrose oil (EPO). As blood concentrations of GLA and DGLA rise, the intake of GLA found in EPO is thought to induce an anti-inflammatory response [9]. Many investigations have also indicated that evening primrose oil has a detrimental impact in AD [10], although other investigations have revealed conflicting results[11]. Evening primrose (Oenothera biennis), a small herb with beautiful yellow blooms flowering in the

evening and belonging to the rosebay willow herb family, is one of the adjuvant therapeutic medicines for AD [12]. It is currently cultivated as a commercial crop, and the valuable oil is extracted from its small seeds. Although some research varied, numerous clinical trials have shown positive benefits of EPO in atopic dermatitis. According to the literature no research has been done on the in Pakistan on the effectiveness of evening primrose oil in the treatment of atopic dermatitis. Therefore we conducted this research to determine the effectiveness of EPO in the treatment of atopic dermatitis in the Pakistani population.

MATERIALS AND METHODS

This research study was randomized controlled clinical trial conducted at the department of dermatology Mian Rashid Hussain Memorial Hospital Pabbi, Nowshera and alkhidmat hospital Peshawar Khyber Pakhtunkhwa Pakistan. The duration of was this research work was six months from November 2020 to April 2021. The inclusion criteria for our research work was all the patients of both the gender diagnosed with atopic dermatitis based on criteria of Hanifin and Rajka [13] having ≤ 10 EASI [14] score while exclusion criteria were patients having other skin issues along with atopic dermatitis, finding of infection, patients with systematic disease and un-controlled chronic problems. Those with another skin condition in combination to AD, an infection finding, a systemic disorder or an untreated chronic illness were eliminated. Pregnant women, lactating women, epileptic patients, peptic ulcer history, phenothiazines intake, in the previous month UVB phototherapy or photo-chemotherapy, and patients taking systemic steroid or other immunosuppressive medications in the last three months were also excluded. Institutional Review Board approved our study. Consent form was signed from all the participants in written form. Totally, 300 patients were included in the study. They were categorized into two groups. 150 patients were included in evening primrose oil group while 150 patients were enrolled in control group. The patients in the evening primrose oil group were treated with topical steroid and emollient in addition to evening primrose oil while patients in control group were treated with only steroid and emollient. Each patient received treatment for a total of 5 months. A baseline assessment of the illness was made and documented in a pre-designed Performa on the initial appointment, in addition to collecting a thorough history, systemic assessment and general assessment. The disease extent, severity, itching and dryness were all definitely documented according to previous study [15]. Each following visit included a clinical assessment of the change in disease state in comparison to the baseline. We considered a marked improvement if the overall score reached 25% of the baseline. It was considered moderate improvement if the overall score was more than 25% but less than 50% of the baseline. Mild improvement was defined as a score more than 50% but less than 75% of baseline. In the instance of marginal improvement, the score was more than 75% but less than 99 percent of the baseline. It was termed static if the score stayed the same. Deterioration was defined as a score higher than the baseline value. No improvement was assigned to the last three kinds of changes (marginal improvement, stasis, and deterioration). Patients were monitored for any adverse effects at each appointment, and if any were observed, they were documented. Data from all the patients of both groups were entered and analyzed using SPSS version 23. Unpaired t test was used to test the significance of the data. P value of <0.05 was measured as significant.

RESULTS

In this study female patients were dominant in both the group. There were 90 (60%) female and 60 (40%) male in evening primrose oil group while there were 86 (57.33%) female and 64 (42.67%) male in control group. (Figure 1) According to the age wise distribution, number of patients in evening primrose oil group of ≤10 years were 66 (44%), 11-20 were 42 (28%) 21-30 20(13.33%) were, 31-40 20(13.33%) and ≥41 were 2(1.33%) while in control group they were 55 (36.67%), 40 (26.67%), 28 (18.67%), 23 (15.33%) and 4 (2.67%) respectively. (Figure 2) According to the status of baseline disease, in evening primrose oil group, the number of patients in moderate, mild and severe atopic dermatitis were 18 (12%), 114 (76%) and 18 (12%) while in control group they were 20 (13.33%), 120 (80%) and 10 (6.67%) respectively. (Figure 3) In the evening primrose oil group, 93 (62%) were with family history of atopy while in control group 87 (58%) were with family history of atopy. (Figure 4) All average values in the evening primrose oil group have gradually and continuously decreased on their 5 successive monthly evaluations in comparison to the baseline values. Substantial decrease in intensity and itching occurs at the completion of the first month. Subsequently, the decrease in average scores of each clinical parameter and the overall score assumed level of significance statistically. Intensity and itchiness ratings also declined significantly. In contrast, the average results in the control group have been delayed, less pronounced and uneven. (Table 1) Improved intensity of all measures except control was also transitory since it did not continue until the completion of the testing period. Table 2 summarizes the AD outcomes in the two patient groups based on a decrease in the disease's overall score. Overall, at the completion of the 5th month, improvement was observed in 147 (98 %) in EPO and 40 (60 %) in control group patients. Treatment outcomes of both the groups were significantly different ($P < 0.00001$, t test).At any stage of evaluation in either group no major adverse effects were recorded.

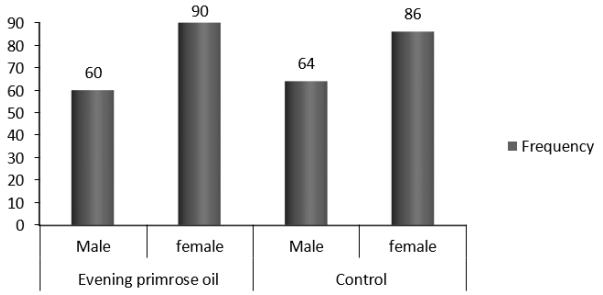

Figure No.1: Distribution of patients based on gender

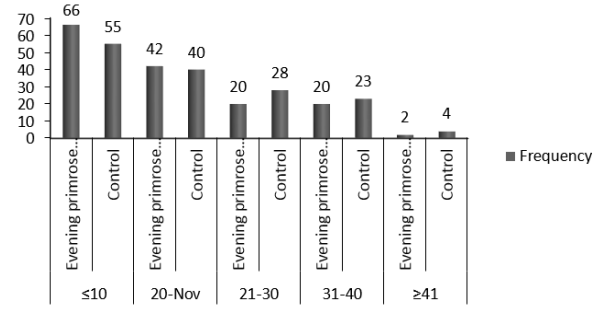

Figure No.2: Distribution of patients based on different age groups

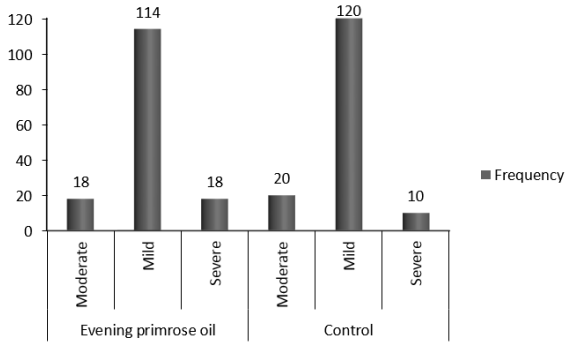

Figure No.3: Distribution of patients based on baseline disease status

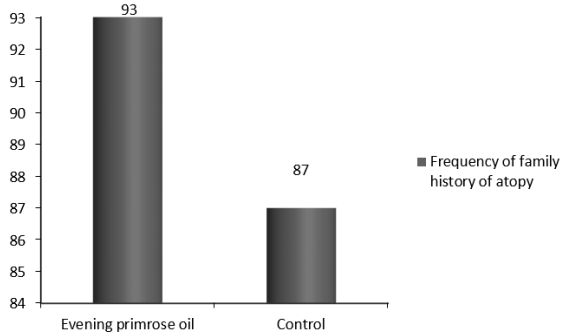

Figure No.4: Distribution of patients based on family history of atopy

Table No.1: Score of the cases during follow up study in both the group

Time (Month)	Group	Extent	Intensity	Itching	Dryness	Total score	P value
Baseline	Evening primrose oil	1.88±0.4	2.08±0.54	1.72±0.42	1.16±0.3	6.84±1.66	0.001
	Control	1.80±0.5	1.44±0.51	1.72±0.42	1.52±0.5	5.48±1.93	
1st month	Evening primrose oil	1.64±0.3	1.56±0.32	1.08±0.4	1.16±0.2	5.44±1.22	0.001
	Control	1.80±0.6	1.40±0.55	1.52±0.2	1.36±0.4	6.08±1.75	
2nd month	Evening primrose oil	1.40±0.5	1.04±0.4	0.96±0.2	0.84±0.3	4.24±1.4	0.03
	Control	1.52±0.2	1.24±0.22	1.40±0.3	1.24±0.2	5.4±0.92	
3rd month	Evening primrose oil	1.0±0.31	0.88±0.34	0.52±0.4	0.84±0.3	3.24±1.35	0.001
	Control	1.48±0.4	1.28±0.42	1.44±0.5	1.16±0.5	5.36±1.82	
4th month	Evening primrose oil	0.84±0.7	0.84±0.22	0.44±0.2	0.52±0.3	2.64±1.42	0.002
	Control	1.48±0.4	1.16±0.66	1.56±0.2	1.08±0.6	5.28±1.86	
5th month	Evening primrose oil	0.64±0.3	0.68±0.49	0.28±0.4	0.48±0.4	2.08±1.59	0.001
	Control	1.72±0.5	1.72±0.32	1.56±0.2	1.12±0.7	6.12±1.72	

Table 2: Outcomes of both the treatment group during follow up

Parameter		Group	1st month	2nd month	3rd month	4th month	5th month
Improved	Marked	EPO	0	0	18 (12%)	54 (36%)	54 (36%)
		Control	0	0	0	15 (10%)	0
	Moderate	EPO	0	45 (30%)	90 (60%)	90 (60%)	84 (56%)
		Control	0	18 (12%)	27 (18%)	15 (10%)	15 (10%)
	Mild	EPO	42 (28%)	90 (60%)	60 (40%)	30 (20%)	9 (6%)
		Control	27 (18%)	42 (28%)	39 (26%)	45 (30%)	45 (30%)
	Marginal	EPO	45 (30%)	27 (18%)	12(8%)	21(16%)	15 (10%)
		Control	29(19.33%)	45 (30%)	21(16%)	21(16%)	39 (26%)
Not improved	Static	EPO	60 (40%)	15 (10%)	0	0	0
		Control	69 (46)	18 (12%)	42 (28%)	39 (26%)	21 (14%)
	Deterioration	EPO	0	0	0	0	0
		Control	27 (18%)	42 (28%)	21(16%)	21(16%)	48(32%)

DISCUSSION

Evening promise, herb of the Onagraceae family, is named because of its blooming during night time. The promise of evening seed oil includes a great quantity of LA and GLA. After being brought to Europe in the 17th century, Evening promise was utilized as a popular folk remedy [15]. GLA has been extracted for the first time from seeds of the evening promise [10, 16]. In the present study the effectiveness of evening primrose oil in treatment of atopic dermatitis was determined. In the current research, we observed that evening primrose oil is both beneficial and safe in the treatment of atopic dermatitis. Therapy with EPO resulted in improvement in overall disease severity beginning as early as the end of the first month of treatment, with 98 percent of patients showing improvement by the end of the 5th month of treatment. There were no side effects associated with the medication. Numerous well organized research investigations conducted in the western countries showed a comparable positive impact of EPO on atopic dermatitis in the pediatric age range [6, 17, 18]. In addition, some improvement in the extent, intensity, itching, and dryness of the symptoms were seen in our patients who received a placebo. These findings, on the other hand, were uneven, non-uniform and non-progressive in nature. The beneficial impact of topical emollient, inherent placebo response and natural fluctuations in the course of AD are all possible explanations for the inconsistent improvement seen in some control-treated individuals. Unfortunately, no researches have been able to show that evening primrose oil has a substantial impact on the therapy of atopic dermatitis. Another earlier research of 102 patients at the Leicester Royal Infirmary in the United Kingdom showed that essential fatty acid supplementation had no impact on atopic dermatitis. Dietary supplementation did not avoid the manifestation of AD in babies with a high family risk, but it did seem to reduce the severity of AD in these children later in life [19, 20]. Numerous covariates, including as racial characteristics, concurrent corticosteroid usage, and other factors that are currently being revealed by new research may explain for previously reported uneven patient response to EPO [10]. Recent studies have revealed new complexity in metabolism of fatty acid and immunologic response in atopic dermatitis that go beyond what has been previously described, and they may soon assist identify subgroups of non-responders and those who may consistently benefit. There are few studies on the effectiveness of EPO in Pakistani individuals with atopic dermatitis. Atopic dermatitis is known to be influenced by genetic and environmental factors. Since our randomized placebo-controlled research found EPO to be helpful in the treatment of atopic dermatitis, we may logically expect comparable studies in Pakistan to have positive findings.

CONCLUSION

Our study concludes that evening primrose oil is effective and safe for the management of atopic dermatitis. Better improvement in management of atopic dermatitis was observed in our study. For better understanding of the effectiveness of evening primrose oil in management of atopic dermatitis further studies having large sample size and follow up for long period of time is recommended.

Author's Contribution:

Concept & Design of Study:	Jamshida Iqbal Khattak
Drafting:	Shahzad Rashid Awan, Saddiq Ullah
Data Analysis:	Naseem Ullah, Shahzeb Mohammad Sohail
Revisiting Critically:	Jamshida Iqbal Khattak, Shahzad Rashid Awan
Final Approval of version:	Jamshida Iqbal Khattak

Conflict of Interest: The study has no conflict of interest to declare by any author.

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