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EFFICACY AND SAFETY OF *FUMARIA INDICA* (AQUEOUS EXTRACT) IN THE TREATMENT OF ACNE VULGARIS

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ABSTRACT

Fumaria indica (Hausskn.) Parsley a well- known crude drug is used in Indian system of medicine and by herbal practitioners for diverse pharmacological activities. In the present study aqueous extract of *Fumaria indica* were selected for analyses, efficacy and safety in the treatment of acne vulgaris. The study design was randomised, single blind, placebo controlled containing thirty (30) cases including both sexes which were divided into two groups (15 in each group). Group 1 received test drug (*Fumaria indica*) and group 2 received placebo orally, for a period of 6 weeks. Patients followed for three visits after every two weeks. Results were extremely significant in group 1($P<0.0001$), and moderately significant in group 2($P=0.0019$), hence group 1 showed significant improvement in both inflammatory as well as non-inflammatory lesions than the group 2 (placebo). These findings together with prior preclinical knowledge of the plant, suggest that *Fumaria indica* could be an easily accessible source for discovering and developing phyto-pharmaceuticals or drugs potentially useful for acne vulgaris.

INTRODUCTION

Medicinal uses of herbs and their combinations are the oldest and still one of the popular systems of health care in India. During the more recent years, herbal medicine has gained popularity and has been widely accepted by the developing countries. This increased demand has triggered interests of many modern medical researchers and clinicians in properly understanding their therapeutic potentials in terms of modern medical sciences. However certain important aspects and some important functions of these medicinal plants are still being evaluated in different research institutes of India and abroad. *Fumaria indica* (Hausskn.) , (Syn: *Fumaria parviflora*, *F. vaillantii)* is an annual herb belonging to the family Fumariaceae commonly known as Indian Fumitory.[1,2,3,4] It is one of the medicinal plants widely used in many other traditionally known medical systems commonly practised in India and elsewhere. It is wildly growing weed found throughout India and many other parts of the globe. In Indian system of medicine the plant has been used as anti-dyspeptic, antihelmintic, antipyretic, diaphoretic, diuretic, laxative, for blood disorders, wounds, diarrhoea, liver complaints, stomachic, syphilis, tuberculosis, purifying blood in skin infections, and is said to be beneficial in aches and pains.[3,4,5,6,7]

The plant has been evaluated for the diverse pharmacological activities like Anti-fungal [8,9,10,11] Antibacterial[5,12,13,14,15,] Antihelminthic[16,17,] Anti-inflammatory[18,19] Anti-nociceptive activity[1] Antioxidant activity[20,21] Antipyretic[15,16,22,23,24] Antiviral[8,11,] Appitiser[22,25] Diuretic16[22,24,26,27] Hepato-tonic[15,23,26] Hypoglycemic activity[24] Immuno-modulatory activities[6] Neuroprotective.[28,29]

Acne vulgaris is a chronic inflammatory disorder of the pilosebaceous follicles with many mainstream treatment options available.[30] Due to adverse effects of long term therapy of systemic and topical antibiotics safe treatment are not available for the treatment of acne vulgaris.[30]

On the basis of these informations objective of the current study was to evaluate the efficacy and safety of *Fumaria indica* in the treatment of acne vulgaris. The goal of therapy included controlling acne lesions, preventing scarring, and minimizing morbidity.

MATERIALS AND METHODS

1 Study Design

It was a randomized, single blind, placebo controlled study. The total nimber of patients, thirty (30) including both sexes, were divided in to two groups (15 in each group). Group 1 received test drug (*Fumaria indica*) and group 2 received placebo orally for a period of 6 weeks. The patients were followed up after every two weeks and at every follow up visit the improvement in acne lesions was assessed.

2 Plant material, extraction and preparation of test drug

Plant material of *Fumaria indica* were purchased from market in New Delhi India. The identification of the plant material was done by NISCAIR, New Delhi. After shade drying, material of *Fumaria indica* was made into coarse powder using mechanical grinder. 1 kg powdered plant was boiled with 10 L of distilled water for 6 hrs in Soxhlet apparatus and allowed to boil exhaustively. The extract was filtered and the filtrate was concentrated through rotary evaporator, which concentrates the solution to small volume without bumping at temperature between 30 to 400C. After the drying of extract it was weighed and pulverized in grinder to make a fine powder. 1000 g of Powder drug gave 180 g extract.

Dose per day :- 1 gm of dried aqueous extract of *Fumaria indica* twice a day with water that is, two capsules twice a day.

3 Assessment of Efficacy of the Test Drug

Assessment of efficacy of the drug was done and recorded after every two weeks on the basis of:

a) the assessment of severity of disease by Global Acne Grading system *(GAGS- reliable and valid tool)*.[31]
b) by the coloured photographs which were taken before and after treatment (with the same magnification).
c) visual analog scale (VAS)for pain and pruritis.[32,33]

4 Assessment of Safety of Test Drug

Assessment of the safety of the drug were made on the laboratory findings that is CBC, ESR, KFT, LFT done before and after the treatment

Results and Discussion :

Acne vulgaris is a disease affecting both the physical and psychological status of the patient. Systemic and topical antibiotics have been used for a long time though they are not completely free from adverse effects.[30] All alternative treatments available carry risks, and none is completely satisfactory.[34]

Plant products have been always useful as they contain a variety of bioactive products which cure various human ailments. So a comparative clinical study was conducted to evaluate the efficacy and safety of *Fumaria indica* in acne vulgaris.

Before starting treatment, the assessment of severity of disease showed 3 patients had very severe grade, 5 patients had severe grade, 14 patients had moderate grade and 8 patients had mild grade of acne vulgaris. After the treatment with test drugs and placebo, results showed that the number of acne lesions decreased in both groups, but results were extremely significant in group 1

(P<0.0001), and moderately significant in group 2 (P=0.0019), hence treatment with test drugs in group 1 showed a significant improvement in both inflammatory as well as non-inflammatory lesions than the group 2 (placebo).

The results also showed that the number of acne lesions decreased through out the treatment, but the decreased number of acne lesions was found to be statistically insignificant at 14th day (P=0.911), 28th day (P=0. 901) and was found to be statistically significant at 42nd day (P=0.026) in both groups.

The exact mechanism of action of *Fumaria indica* selected in this study has not yet been worked out, but the significant improvement in both the inflammatory and non-inflammatory lesions in group 1, than the group 2 is due to the known pharmacological functions of this drug like Antibacterial (Gram-positive and Gram-negative bacteria)[14,15,35,36,37] Anti-inflammatory[15,16,18,19,22,24,25,35,38,39,40,41,42,49] Antioxidant[27,43] Antiseptic activity[24,37,41] Blood purifier[18,19,35,37,40] and Wound healer.[16,23,37,38,44,45] In the last few years, a large number of scientific studies have reported that several alkaloids are present in the drug, such as β-sitosterol, Caffeic acid, Fumaric acid, Monomethyl fumararte, Narceimine, Protopine has anti-inflammatory activity[1,10,28,29,46,47,48,49] Fumaric acid has immunomodulatory activity[28,40,41] Caffeic acid and b-sitosterol 3 has anti-nociceptive activity[10] Berberine iodide Protopine has antibacterial activity[11,35] Fatty acids has antioxidant activity.[50]

In pustular and nodulocystic acne, usually pain is present to some extent. In the present study the assessment of pain by Visual Analog Scale showed 16 patients out of 30 patient had mild to moderate pain and after using test drug there was extremely significant improvement in group1, (P=0.0018), than group 2 (P>0.0104), this extreme improvement in group 1 is due to the anti-inflammatory and analgesic activity of *Fumaria indica*.[22, 35, 38, 41] Analgesic activity of *Fumaria indica* is due to the alkaloids such as Fumariline Protopine.[10, 11]

However, some data suggest that at least a few acne sufferers may experience itching during the disease course.[51, 52] In the present study the assessment of pruritis by Visual Analog Scale showed that itching of mild to moderate severity is a relatively common concomitant symptom of acne lesions and it involves 14 patients out of 30 patients. The treatment with test drug showed statistically significant improvement in group1 (P=0.076), than group2 (P=0.164). The improvement in group1 is due to the antihistaminic activity of *Fumaria indica*. The alkaloid Quercetin is most importantly known for its ability to act as antioxidant. It possibly stabilizes cell membranes of mast cells by inhibiting the production and release of histamine and other allergic/inflammatory substances.[53, 54]

The test drugs used in this study did not report any adverse effect, nor produced any statistically significant difference in pre and post treatment laboratory parameters i.e. in CBC, ESR, KFT and LFT. Recently it has been reported in preclinical study that ***Fumaria Indica*** was found to be safe in cytotoxic test and devoid of toxic manifestations during chronic administration[55] and it was also reported that ***Fumaria indica*** have significant antihepatotoxic activity.[56,57]

CONCLUSION

It is concluded that the oral test drugs used in this study are effective and safe in the treatment of acne vulgaris.

It is also concluded that at the end of 6th week of test drug therapy (at 42nd day); there was excellent response in group 1 than in group 2.

The present study justifies the use of *Fumaria indica* extract for treating various skin infections although the mechanism involved was not determined in the present study; this is likely to be a focus of further studies in the future.

Table 1: Distribution of Patients According to GAGS

GAGS	No. of Patients	Percentage
Mild	8	27
Moderate	14	46
Severe	5	17
Very severe	3	10
Total	30	

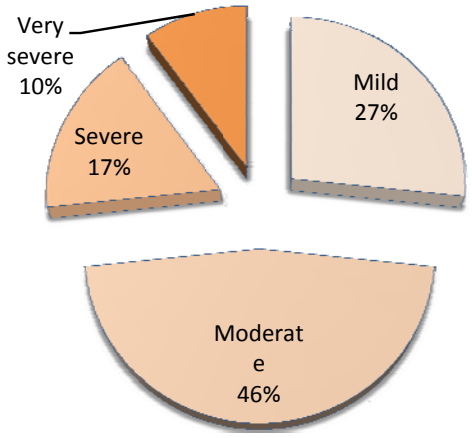

Figure 1 : Distribution of Patients According to GAGS

Table 2: Effect of *F. Indica* on severity of Acne Lesion by Using GAGS in Group 1

GAGS visits	Mean	Std. Deviation	Friedman Test		
			Friedman Mean Rank	Chi-Square value	Asymp. Sig
Day 0	22.80	5.321	3.87	41.640	0.0001
Day 14	17.60	4.925	3.07		
Day 28	13.80	4.003	2.07		
Day 42	7.866	4.015	1.00		

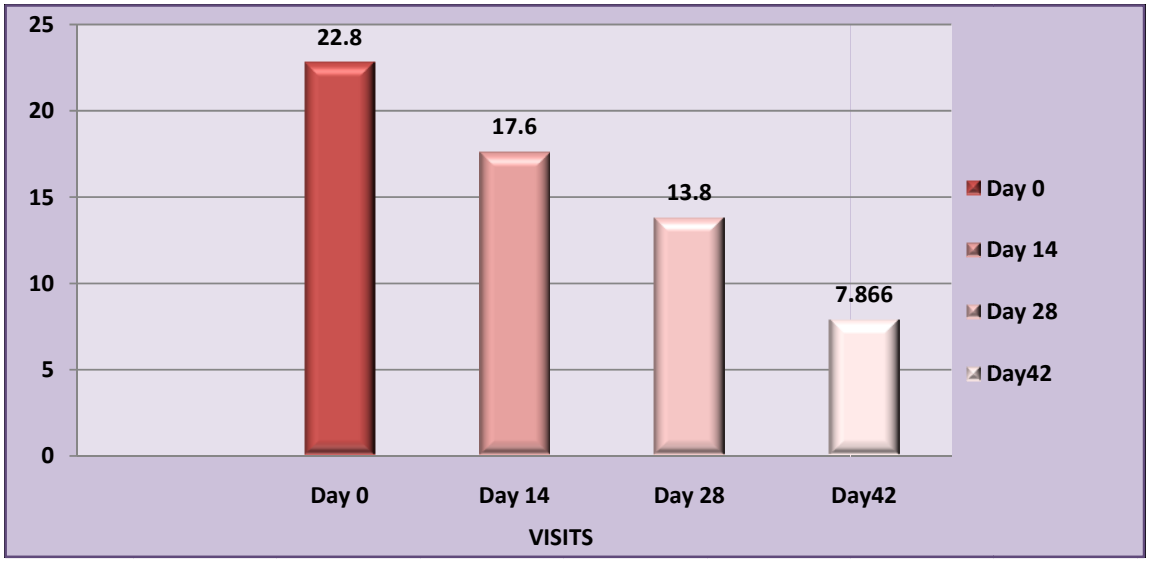

Figure 2 :Effect of *F. Indica* on severity of Acne Lesion by Using GAGS in Group 1

Table 3: Effect of Placebo on severity of Acne Lesions by Using GAGS in Group 2

GAS visits	Mean	Std. Deviation	Friedman Test		
			Friedman Mean Rank	Chi-Square value	Asymp. Sig
Day 0	19.266	8.075	3.47	14.908	0.0019
Day 14	17.266	6.134	2.53		
Day 28	15.933	7.095	2.00		
Day 42	15.266	7.887	2.00		

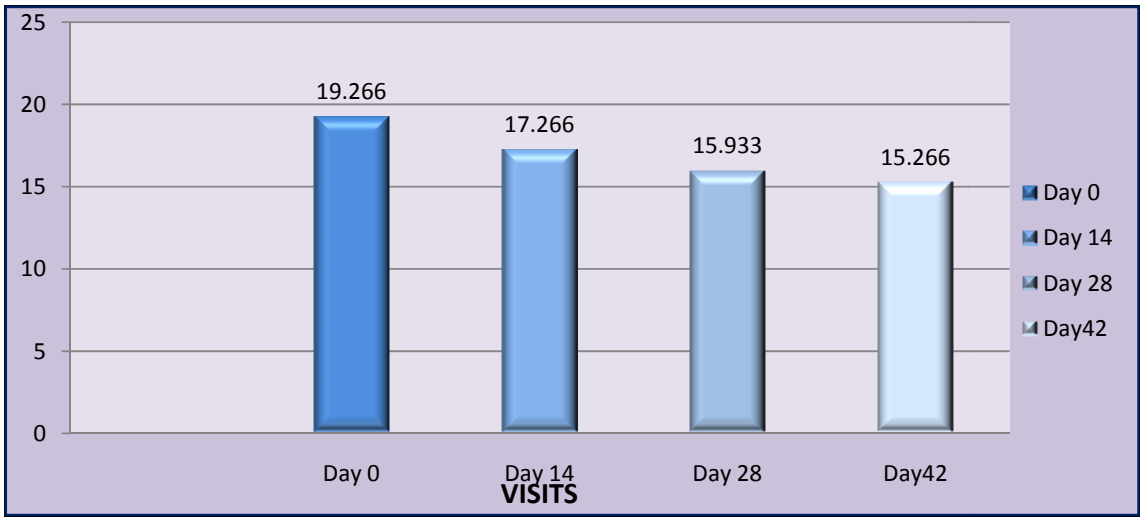

Figure 3 : Effect of Placebo on severity of Acne Lesions by Using GAGS in Group 2

Table 4: Effect of *Fumaria indica* (Group 1) & Placebo (Group 2) on VAS Score of Pain

	Vists	Mean	Std.Deviation	t	Asymp. Sig (2tailed)
VAS in Group 1	**Pre**	3.333	2.663		
	Post	1.133	1.245		
	Pre Vs Post	2.2	2.21	3.85	0.0018
VAS in Group 2	**Pre**	1.866	2.663		
	Post	0.866	1.06		
	Pre Vs Post	1	1.309	2.95	0.0104

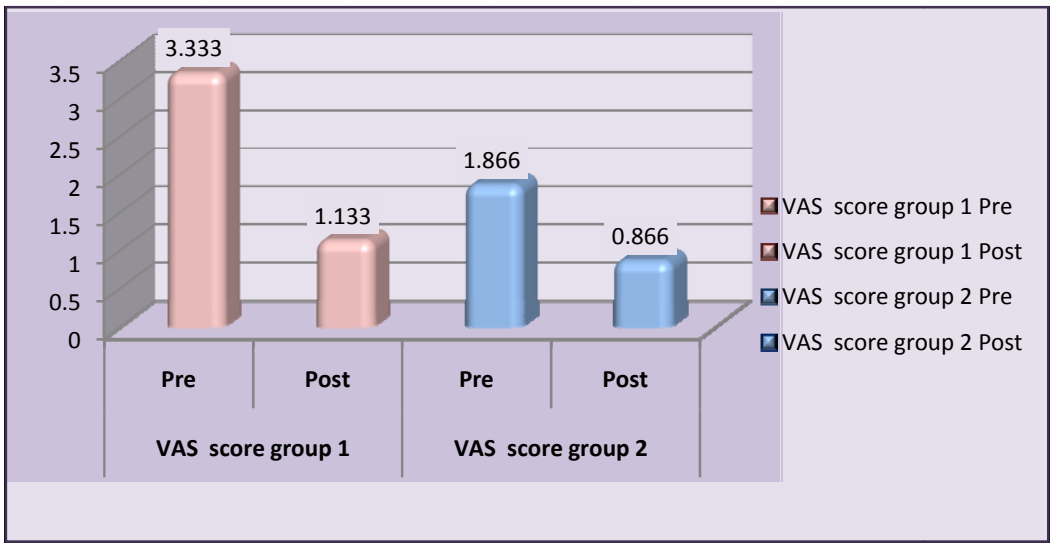

Figure 4 : Effect of *Fumaria indica* (Group 1) & Placebo (Group 2) on VAS Score of Pain

Table 5: Effect of *Fumaria indica* & Placebo on VAS Score of Pruritis in Group 1 & Group 2

	Visits	Mean	Std. Deviation	t	Asymp. Sig (2tailed)
VAS in Group 1	Pre	1	1.603		
	Post	0.333	0.723		
	Pre Vs Post	0.666	1.345	1.91	0.076
VAS in Group 2	Pre	0.533	1.125		
	Post	0.4	0.828		
	Pre Vs Post	0.133	0.351	1.46	0.164

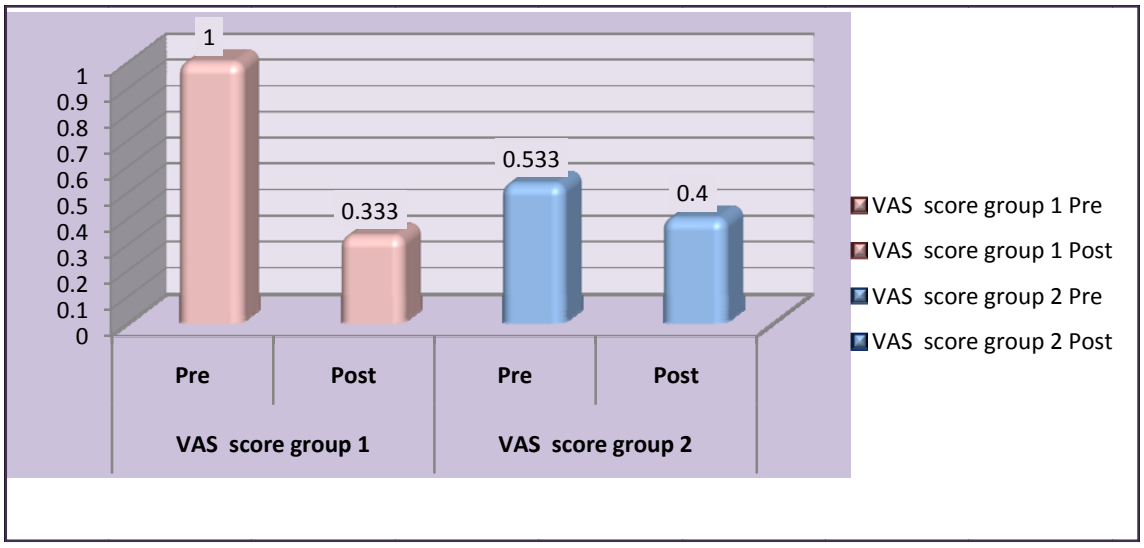

Figure 5 : Effect of *Fumaria indica* & Placebo on VAS Score of Pruritis in Group 1 & Group 2

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