Treatment of acne vulgaris with 2% topical tea lotion

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ABSTRACT

Objective: To use 2% tea lotion as natural plant remedy in the treatment of acne vulgaris.

Methods: We conducted this study in the Department of Dermatology and Venereology in Baghdad Teaching Hospital, Iraq during the period between October 2002 and October 2004. In this single–blind randomly controlled therapeutic study, we enrolled 60 patients, their ages ranged from 14-22 years. There were 35 females and 25 males. We divided the patients equally into 2 groups; we instructed group A to use freshly prepared 2% tea lotion twice daily for 2 months, while group B used a control solution. We graded the acne vulgaris as mild and moderate acne by counting the number of papules and pustules. We carried out statistical analysis by computer using t-test, f-test, and chi-square when needed.

Results: Forty-nine patients completed the study. In group A (25 patients), we noted a significantly reduced mean lesion count of papules and pustules after 2 months of therapy. The response of patients to treatment was good in 64%, moderate in 24% and no response in 12%. The satisfaction of patients with treatment was full in 64%, partial in 24%, and no satisfaction in 12%. In group B (24 patients), the lesions showed no significant reduction after 2 months and the response of patients to treatment was good in 20.8%, moderate in 45.8%, and no response in 33.4%. The satisfaction of patients with treatment in this group was full in 4.2%, partial in 12.5%, and no satisfaction in 83.3%. The mean difference in outcome after 8 weeks between the 2 study groups was statistically significant.

Conclusion: The 2% tea lotion has proved its efficacy as a topical therapy for acne vulgaris. This is a new natural plant extract, which lacks any side effects.

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We use tea, as a traditional beverage, extensively throughout the world. Black tea contains many chemical compounds like tannins, mainly catechins, flavonol, and an alkaloid substance.[1] We have used tea as an antibacterial, antioxidant, antiandrogen, and immune modulating agent.[2-5]

Recently, we also see the use of tea ointment effectively in the treatment of impetigo contagiosa in children.[6] Acne is a major skin problem among the youth, and usually initiated by androgen and propagated by bacterial flora of hair follicles like *Propionibacterium* acnes (*P*-acne). The aim of the present work is to evaluate 2% tea lotion in treatment of acne vulgaris, mainly as antibacterial agent.

Methods. This study was conducted in the Department of Dermatology and Venereology in Baghdad Teaching Hospital, Iraq during the period

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between October 2002 to October 2004. The number of patients examined was 60 and their ages varied from 14-22 years with a mean age 17.8 ± 3.3 SD, 25 were males and 35 females. Full history was taken from each patient regarding age, gender, and duration of the disease, previous treatment and ensured that every patient had stopped any systemic and topical treatment at least 2 months before starting the present therapy. Physical examination was carried out to evaluate the severity of acne. Scoring the severity of acne was according to the following rule;[7] 1. Mild acne, in which the count of pustules is less than 20, and the count of papules is less than 10. 2. Moderate acne, in which the count of pustules ranges between 20-40, and the count of papules ranges between 10-30. 3. Severe acne, in which the count of pustules is more than 40, and the count of papules is more than 30. Comedonal type, severe acne, and nodulo-cystic lesions were excluded from the present study. In this method, the tea leaves (swan brand mark) was added to boiling water (35 gm of tea was added to 100 ml boiling hot distilled water), and then flame reduced to minimum and kept on low flame for 30 minutes (Iraqi method of decoction), then we let the tea extract cool down. We took 100 ml of tea extract and 100 ml of distilled water, and we weighed them. The excess weight in the extracted tea is the amount of pure tea material in tea lotion, for example, if the difference is one gram between tea lotion and distilled water then the percentage is 1%.[6] The 1% tea extract was boiled again until two-thirds of the water evaporated, to reach 3% tea extract concentration, however, this preparation is too thick to be used on the face. Therefore, 2% tea lotion (100 ml) was prepared by adding 75 ml tea extract and 25 ml of ethanol (95% purity), which is used as a preservative. The control solution was prepared by adding 75 ml of distilled water to 25 ml of ethanol (95% purity). Oral consent was taken from each patient before therapy. Patients were divided randomly into 2 groups: Group A: In this group, 30 patients (mean age 17.5 ± 3.9 years) were treated with 2% tea lotion. Each patient was instructed on how to use the lotion topically, twice daily for 2 months and clinical evaluation was carried out monthly. The assessment was carried out by counting the inflammatory lesions (papules and pustules) and watching for any side effects. Group B: In this group, 30 patients (mean age 18.1 ± 3.7 years) were treated in the same manner as tea lotion, but using the control solution. These cases were followed up for 2 months by counting the number of papules and pustules and observing any side effects. The response of patients to treatment was classified as: Good response, in which the reduction in the count of inflammatory lesions (papules and pustules) is more than 50%. Moderate response, in which the reduction in the count of inflammatory lesions (papules and pustules) ranged from 10-50%. No response, in which the reduction of papules and pustules is less than 10%. The satisfaction of the patients to the treatment are classified into: 1. Full satisfaction. 2. Partial satisfaction. 3. No satisfaction. Statistical analysis was carried using EPI version 6. Both descriptive and analytic data were used. Calculation of mean and SD was carried out for ages, papules and pustules. The analytic test used was F-test to compare means, t-test was used to compare the mean difference in outcome between the 2 study groups after 8 weeks, and chi-square for qualitative data.

Results. Sixty patients were included in the study, and 49 patients completed the course of treatment. In group A there were 25 patients, 15 females (60%) and 10 males (40%), while in group B, there were 24 patients, 13 females (54%) and 11 males (46%). Eleven patients (16.7%) did not complete the treatment and were considered defaulters for unknown reasons. **Table 1** shows the mean SD of the papules and pustules count before and after therapy. In group A there was a significant reduction in the mean SD of papules at the end of the study. For pustules, there was also a significant reduction in mean SD of pustules at the end of the study. In group B there was a non significant reduction of papules noted at

Table 1 - Mean ± SD of papules and pustules counts before and after therapy.

Group		Mean ± SD		
		0 week	4 weeks	8 weeks
Group A	papules	12 ± 3.3	10.9 ± 2.9	8.1 ± 1.9
	pustules	20.7 ± 5.8	15.7 ± 4.1	8.9 ± 2.3
Significance	F1 papules	13.24	*p*=0.00001	
	F1 pustules	47.25	*p*=0.0000001	
Group B	papules	11.7 ± 3.3	11.1 ± 2.5	10.9 ± 2.4
	pustules	20 ± 5.1	19.1 ± 4.9	18.3 ± 3.3
Significance	F2 papules	0.45	*p*=0.583	
	F2 pustules	0.89	*p*=0.429	

Table 2 - The mean difference in outcome after 8 weeks between 2 study groups.

Type of lesion	Group A	Group B	t-test	*p*-value
Papule	3.9 ± 1.4	0.8 ± 0.9	9.26	0.004
Pustule	11.8 ± 3.5	1.7 ± 1.8	12.78	0.001

Table 3 - Response to treatment in both groups.

Group	No improvement n (0-10%)	Moderate improvement n (10-50%)	Good improvement n (>50%)
Group A n=25	3 (12)	6 (24)	16 (64)
Group B n=24	8 (33.4)	11 (45.8)	5 (20.8)
	Chi-square = 9.49	*p*=0.008	

the end of the study. The reduction in pustules at the end of study was also statistically non significant. **Table 2** shows the mean difference in outcome after 8 weeks between the 2 study groups. **Table 3** shows the response to treatment in both groups. Assessment of patient satisfaction in group A showed 16 patients (64%) fully satisfied, 6 patients (24%) partially satisfied, and 3 patients (12%) not satisfied. In group B this showed, 20 patients (83.3%) not satisfied, 3 patients (12.5%) partially satisfied, and one patient (4.2%) fully satisfied. For sex, age of patients and duration of the disease, the present work showed no difference in response to therapy.

Discussion. There are many drugs and preparations used in treatment of acne vulgaris like topical treatment such as erythromycin, clindamycin, benzoyl peroxide, azelaic acid, and retinoic acid, while systemic therapy includes oral tetracycline, erythromycin, co-trimoxazole, oral retinoid and hormonal therapy.[7-9] Tea has been used as an antibacterial, antioxidant, antiandrogen and immune modulating agent.[2-5] Recently tea ointment has been used in treatment of impetigo contagiosa and is considered as a new effective therapy.[6] On reviewing the chemical composition of tea, there are many active ingredients like tannin (catechin), alkaloid, flavonol, enzymes and amino acids. The phenolic groups of tannin are responsible for its antibacterial effect. One of the etiological factors in the pathogenesis of acne vulgaris is bacteria. *P*-acne is the most important bacteria engaged in the causation of acne vulgaris, so in the present therapy tea was used mainly as antibacterial agent, which was confirmed by many studies.[2,6] In addition, most recently epigallocatechins gallate of tea was reported to modulate the production and biological action of androgen and other hormones. So, modulation of androgenic activity may also play a role in treatment of acne vulgaris, however, this observation needs further study and evaluation.[4]

The present work showed that 2% tea extract lotion was effective in clearance of papules and pustules, especially in mild and moderate acne. This result was comparable to the therapeutic action of other topical agents like topical benzoyl peroxide and topical erythromycin, which act as antibacterial agents and mainly on inflammatory lesions like pustules and papules, but tea lotion has a more rapid action than erythromycin as tea caused a significant reduction after 8 weeks, while topical erythromycin caused significant reduction after 12 weeks.[7,10]

The tea lotion showed no side effects, and can be considered very safe when compared with other topical therapies like tretinoin and benzoyl peroxide that are commonly associated with local and systemic side effect such as local irritation, burning sensation, dryness of skin, peeling and teratogenic effects.[7,9]

The present study recommends the use of tea lotion as a topical therapy for acne vulgaris, as it is a natural plant extract.

In conclusion, tea lotion is an effective, safe, non-costly, and well-tolerated topical treatment of mild and moderate acne vulgaris.

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