

Clinical and Pathological Evaluation of Hemp Seeds Oil Effectiveness in the Treatment of Alopecia Areata

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Abstract

Background: Alopecia areata is an inflammatory, autoimmune, non-scarring, common patchy, hair-loss condition. Many treatment lines are used to treat alopecia areata, but all are palliative. Alternative medicine, like aromatherapy is expected to promote hair growth, but they are still lacking the scientific basis. Hemp oil is one of the aromatherapies that comprises polyunsaturated fat in approximately 76% involving “essential fatty acids” mainly omega-6 fatty acids” and lesser amount of “omega-3 fatty acids.” **Objective:** The aim of this study was to evaluate hemp seed oil effect in the treatment of patients with alopecia areata. **Materials and Methods:** This was a clinical trial planned to evaluate the efficacy of hemp seed oil in 20 patients with localized alopecia areata for 2 months. Plant material is hemp oil extract, applied at night daily for 2 months. Regrowth of terminal hair was evaluated by clinically and by trichoscope examination to evaluate the pathologic changes response. The assessment was done at 0, 4, and 8 weeks of the treatment. **Results:** After 8 weeks of the treatment, the response was marked in five (25%) patients, moderate in eight (40%) patients, and mild in two (10%) patients. Five (25%) patients revealed no response. There was a significant increase in the response of patients who were under the marked improvement group between 4 and 8 weeks of treatment ($P < 0.05$). **Conclusion:** Hemp seed oil can be considered as a promising therapeutic agent for localized alopecia areata. Additional clinical trials are advised to adjust the dose and determine the period of time, which is required to obtain a better result.

Keywords: Alopecia areata, aromatherapy, hemp seed oils, pathologic criteria

INTRODUCTION

Alopecia areata is an inflammatory, autoimmune, non-scarring, common patchy, hair-loss condition. It affects men and women equally. The pathogenesis is still unclear, but genetics, organ-specific autoimmune reactions, family history, atopic state together with probable neurologic factors and emotional stress have been involved.^[1] Pathological findings of the active patch of hair loss show predominant T-lymphocytes infiltrate, which is supposed to play a crucial role in the disease process and the response of patients to immune-modulators.^[2]

Many palliative treatment lines are used to treat alopecia areata such as contact sensitizers, topical steroids, biologic response modifiers, and immune-modulators.^[3] Alternative medicines, such as onion, garlic, aromatherapy, and hypnotherapy, are expected to promote hair growth but they are still lacking the scientific basis.^[4] Aromatherapy

includes essential oils and substances obtained from flowers, wood resins, and plants that are used as skin care products; thus, aromatherapy is gaining great attention because of its health promoting properties. These essential oils are complement to traditional medicine with some benefit.^[5]

Hemp seed pressing is being used to produce hemp seed oil. Crude hemp oil from cold presser usually has dusky-clear light green color, with nut taste. Many industries have been established for hemp oil as in dyes, lubricants, inks, and plastic products. It has wide applications in body care products such as shampoos, soaps, and detergents.^[6,7] Hemp

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seed oil is prepared in industries from *Cannabis sativa*, which carries low quantities of the chief psychoactive element of the cannabis “tetrahydrocannabinol.”^[8] Edible oil forms approximately 49% of the weight of hemp seed.^[9] The seeds oil contains omega-6 to omega-3 essential fatty acids in a 3:1 proportion.^[6,9] It consists of 76% omega-6 fatty acids (polyunsaturated fat) like gamma-linolenic acid of approximately 3% and linolenic acid 54%, and omega-3 fatty acids like α -linolenic acid of approximately 17% and stearidonic acid 2%. Hemp seed oil contains approximately 5%–7% saturated fat and approximately 5%–11% monounsaturated fat.^[9] This study aimed to assess the effect of hemp seed oil in the alopecia areata treatment, both clinically and pathologically.

MATERIALS AND METHODS

Selection of patients

Twenty patients with localized alopecia areata patches on the scalp or beard area, not more than 2 cm in diameter, are selected for this study. The study included five women (25%) and 15 men (75%). Their ages ranged from 10 to 39 years. The study was carried out between October 2021 and September 2022 in Baghdad, Babylon, and Najaf provinces of Iraq. The exclusion criteria of the study included patients with any other types of alopecia (universalis or Ophiasis), those with diffuse alopecia areata, those who with a past history of any topical or systemic treatment prior to this study for at least 4 weeks duration, those who were pregnant and lactating females, and those with a history of some autoimmune disorders that could manifest as or associated with alopecia.

Hemp oil extract treatment

Ready to use hemp oil extract is obtained from Iraqi local markets under the name of “Afghan hemp oil” applied at night every day for 2 months. Evaluation and assessment of responses of the patients to the treatment were done every 4 weeks. The authors elucidate the way and the amount of hemp oil application, and show the precise technique of scalp massage for 5 min. The oil then must be left for 6 h on the scalp. The scalp must be covered to allow the oil to be absorbed. This technique was advised to be used every day.

Clinical examination

Clinically, regrowth of hair was assessed based on “Global assessment: overall improvement; this takes into account

extent and density of regrowth by the SALT scoring system.” Percentage of regrowth was noted first, followed by categorization as follows: no response = no change or further loss, mild response = less than 25% regrowth, moderate response = 25%–50% regrowth, marked response = 50%–75% regrowth.^[10]

Trichoscopy examination and pathologic criteria

Specific pathologic changes of alopecia areata are examined in the participants by a pathologist. Manual trichoscope was used to identify specific changes for this disease, namely black dots, tapering hairs, and cadaverized hairs. All the selected participants are identified to have these three changes. The response of the patients to the hemp oil extract treatment was defined by the fade of theses pathologic changes and re-growing of vellus hairs which are examined by using the trichoscope.

Statistical analysis

Statistical analysis was done by using Statistical Package for the Social Sciences (SPSS), version 26 (IBM, New York). Calculation was done by using analysis of variance (ANOVA) test. A value of $P < 0.05$ was considered significant.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients’ verbal and analytical approval before sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 25 dated November 5, 2022.

RESULTS

Clinical examination shows a response of patients to the treatment with hemp oil extract

After 4 weeks of treatment, hair regrowth revealed marked response in one (5%) of the patients, moderate in four (20%) patients, mild in six (30%) subjects and no response in nine (45%) of the treated patients. After 8 weeks of treatment, there were marked response in five (25%) of patients (significant difference, $P < 0.05$), moderate in eight (40%) of patients, mild in two (10%) patients, and five (25%) patients revealed no response [Table 1].

Table 1: Clinical response of the hair to hemp oil among patients with alopecia areata				
Duration of treatment	No (No. %)	Mild (No. %)	Moderate (No. %)	Marked (No. %)
4 weeks	9 (45)	6 (30)	4 (20)	1 (5)
8 weeks	5 (25)	2 (10)	8 (40)	5 (25)
Patients grouped to four categories in their response to this treatment				
$P < 0.05$ (significant difference in marked response after 8 weeks when compare to 4 weeks treatment)				

Table 2: Response of patients with alopecia areata to the hemp oil pathologically after 4 and 8 weeks of treatment

Pathologic criteria	Response of patients (absence of lesion)			
	50%–70% of lesion	30%–50% of lesion	10%–30% of lesion	Less than 10% of lesion
	No. of patients and percentage			
Black dots, tapering hairs and cadaverized hairs after 4 weeks of treatment	3 (15%)	6 (30%)	8 (40%)	3 (15%)
Black dots, tapering hairs and cadaverized hairs after 8 weeks of treatment	5 (25%)	10 (50%)	2 (10%)	3 (15%)
Patients grouped to four categories in their response to this treatment				
$P > 0.05$				

Pathologic examination demonstrates good response of patients to the hemp oil extract

After 4 weeks of treatment, trichoscope examination showed that 3 of 20 (15%) of patients showed absence of black dots, tapering hairs, and cadaverized hairs in most of alopecia areata sites (50%–70% of the total area of lesion) and had re-growing of vellus hairs. In addition, 6 of 20 (30%) of those patients showed absence of pathologic lesion in approximately 30%–50% of affected area. Moreover, 8 of 20 (40%) of patients reported to show the absence of black dots, tapering hairs, and cadaverized hairs in 10%–30% of affected area. Response is less than 10% of affected area in remaining participants, 3/20 (15%) of patients.

Pathologically, the response of the patients to the treatment shows increase improvement after 8 weeks of treatment although data did not reach significant value. Trichoscope examination showed that 5 of 20 (25%) of patients had not black dots, tapering hairs, and cadaverized hairs in most of alopecia areata sites (50%–70% of the total area of lesion) and had re-growing of vellus hairs. In addition, 10 of 20 (50%) of those patients showed absence of pathologic lesion in approximately 30%–50% of affected area. Moreover, 2 of 20 (10%) of patients reported to show the absence of black dots, tapering hairs, and cadaverized hairs in 10%–30% of affected area. Response is less than 10% of affected area in remaining participant, 3/20 (15%) patients [Table 2].

DISCUSSION

Alopecia areata has a chronic course, in which sudden hair loss resulted from inflammation of the hair follicles, usually limited to the scalp in patchy pattern. Approximately 80% of patients with spontaneous remission within 1 year. Reassurance with medical treatment is of benefit. Alopecia areata may psychologically affect the patient. Using multiple agents to overcome the clinicopsychological effect may cause side effects of some medications.^[11] Herbal medicine could be one of the safest methods in the prevention and treatment of disease.^[12,13] We tried to evaluate effectiveness of hemp seed oil in alopecia areata as there is no scientific evidence for its benefit. The precise mechanism of therapeutic influences of hemp seeds oil is

not completely definite, and additional research works are required.

Cannabis sativa-based remedies, “cannabidiol” has appeared as a promising, non-prescription, active, relatively safe, low-priced, topical treatment for androgenic alopecia.^[14] Cannabidiol acts via the endocannabinoid system and has unique effect on hair follicle prolongation and stimulated keratinocytes of the matrix over endocannabinoid receptors of the hair follicle.^[15] There is a significant quantity of cannabinoid receptors (CB1/CB2) on different cell lines within the skin.^[15] The hair follicle cells are expressing high quantities of CB1 receptor, and when activated these lead to reduce elongation of the hair shaft.^[16] Research found that the endocannabinoid system is a crucial factor in controlling the growth of the hair follicle as hemp seeds oil can antagonize CB1 effects.^[15,16] A randomized clinical trial of aromatherapy found that 19 (44%) of 43 patients included in such a study had an improved performance after hemp seeds oil application.^[17]

Our study shows significant increase in number of patients with marked improvement after 8 weeks treatment comparing to 4 weeks treatment. Hemp oil contains essential fatty acids mainly omega-6 and less amounts of omega-3.^[9] Applying these essential oils into the 86 Alopecia areata patients' scalp for 7 months verified important hair growth enhancement in 44%, in comparison to other control group having 15% of patients.^[17] A double-blind clinical trial conducted on 69 Alopecia areata patients treated for 26 weeks by joining essential oils with low-intensity electromagnetic pulses confirmed significant improvement in the growth of hair.^[15] Our results show good response of patients to this type of treatment pathologically. The pathologic lesions in 10 patients (50% of cases) responded well to hemp oil treatment after 8 weeks although the result does not reach significant value compared to 4 weeks treatment. Up to 50% of lesions become free from black dots, tapering hairs, and cadaverized hairs. Regarding this part of research, up to knowledge there is no previous published data to compare with it.

Transforming growth factor- β antagonists are active in inhibiting catagen-like hair architectural alterations and in

supporting prolongation of hair follicles both in vitro and in vivo equally.^[18] One of the possible explanations of the positive effects of the hemp seeds oil is via the protecting influences of omega-6 in relation to transforming growth factor- β 1.^[19,20] Other postulated mechanism could be owing to platelet-derived growth factor (PDGF). PDGF has a potent mitogenic cellular activity for numerous cells.^[21] PDGF has a role in hair follicle growth as the expression of PDGF receptors in epithelium of the hair follicle had been documented.^[21]

CONCLUSION

In conclusion, hemp seed oil can be considered as a promising therapeutic agent for localized alopecia areata. Additional clinical trials with increase number of participants are advised. Optimizing the dose and time required for treatment is very essential to obtain better results.

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Conflicts of interest

There are no conflicts of interest.

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