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Comparison of the efficacy of topical lawsonia inermis and topical minoxidil in the treatment of telogen effluvium

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ABSTRACT

Background: Telogen effluvium (TE) is one of the most common types of diffuse hair shedding, in which anagen-phase hair follicles prematurely transit to the telogen phase after an acute illness, resulting in increased hair shedding 2 to 3 months later. There are a few treatment modalities for TE, so we decided to do this randomized clinical trial to compare the efficacy of the minoxidil and Lawsonia inermis (Henna) in the telogen effluvium for the first time in the world. **Patients and Methods:** In this double-blind, randomized clinical trial, we compared the efficacy of the minoxidil and Henna lotion in the telogen effluvium. It was a double-blind randomized clinical trial in that 60 patients with telogen effluvium were divided randomly in two equal groups. In Minoxidil Group, 30 patients applied 1 ml of minoxidil solution 2% twice daily. In Henna Group 30 patients applied 1 ml of henna lotion twice daily. **Results:** The mean duration of telogen effluvium was 6.33 weeks in minoxidil group and 7 weeks in the Henna group. This difference was not statistically significant. No side effect was detected in any of the two groups. **Conclusion:** Our study indicated that Henna lotion is as effective as minoxidil in treatment of TE. © 2011 Trade Science Inc. - INDIA

KEYWORDS

Telogen effluvium;
Minoxidil;
Lawsonia inermis.

INTRODUCTION

Scalp hair grows in cycles. Diffuse hair shedding is the result of a disruption of one phase of the hair cycle, i.e., anagen (active hair growth), catagen (involution), or telogen (resting). The anagen phase can last 2 to 8 years, the catagen phase lasts 4 to 6 weeks, and the telogen phase lasts 2 to 3 months^[1,2]. Studies on human head hair growth have shown that at any point in time, most (80% to 90%) of the hairs are in the anagen phase, with 1% to 2% in the catagen phase and the remaining 10% to 20% in the telogen phase^[5]. Shedding of 100

to 150 telogen hairs per day is normal^[4]. TE is one of the most common types of diffuse hair shedding, in which anagen-phase hair follicles prematurely transit to the telogen phase after an acute illness, resulting in a noticeable increase in hair shedding at the end of the telogen phase 2 to 3 months later^[3].

TE can be acute (lasting < 6 months), chronic (6 months or more), or chronic-repetitive^[6]. Drugs, surgery, high fever, chronic systemic illness, hemorrhage, childbirth, zinc deficiency, iron deficiency, vitamin D deficiency, Biotin deficiency, severe protein deficiency, fatty acid and caloric restriction may cause telogen ef-

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fluvium 2 to 3 months after the insult. The relationship between chronic diffuse hair loss and sychological stress is controversial^[3,7,8,9,10].

Herbal medicines have been used since the dawn of human civilization to treat diseases. WHO estimates that about three-quarters of the world's population currently uses herbs and other forms of traditional medicines for mitigation and cure of various ailments. Herbal medicines hold a major forte as a form of therapy for a substantial percentage of world population. On one hand the ethno-social beliefs of people strengthen the importance of natural products. Though there is anecdotal evidence supporting the use of herbal medicines, scientific studies in this field are in their infancy^[11].

Henna (*Lawsonia inermis*) has been used as a herbal medicine in treatment of TE traditionally^[12].

While topical minoxidil is not proven to promote recovery of hair in telogen effluvium, this medication has a theoretical benefit and is well tolerated. Patients who are eager to play an active role in their treatment may choose to use minoxidil^[13].

In our knowledge there is no clinical trial about the efficacy of henna for TE, so this clinical trial was designed to compare the efficacy of Henna lotion, and 2% topical minoxidil solution in treatment of TE.

MATERIALS AND METHODS

This was a randomized, double-blind clinical trial at Ashayer Dermatology Clinic of Lorestan University of Medical Sciences, Iran. Written consent was obtained from each patient before inclusion in this study. 60 patients with clinically confirmed telogen effluvium were assigned randomly in two groups. All of the patients had positive hair pull test and a known cause for their diseases. Exclusion criteria were pregnancy, sensitivity to minoxidil and sensitivity to Henna. The products were supplied with identical packaging and randomly coded. Codes were not available for investigators until final data review. Patients were randomly divided in two groups. In Minoxidil Group, 30 patients applied 1 ml of minoxidil solution 2% twice daily. In Henna Group 30 patients applied 1 ml of henna lotion twice daily.

Patients were evaluated every week by a derma-

tologist, and gentle hair pull test was done for each patient in each visit. In this test 20 hairs were grasped between the thumb and the index finger, and gently pulled. A negative test (two or fewer hairs) indicated termination of TE, whereas a positive test (more than two hairs) indicated continuation of TE. Patients had been suggested not to shampoo their hair 24 hours before the test.

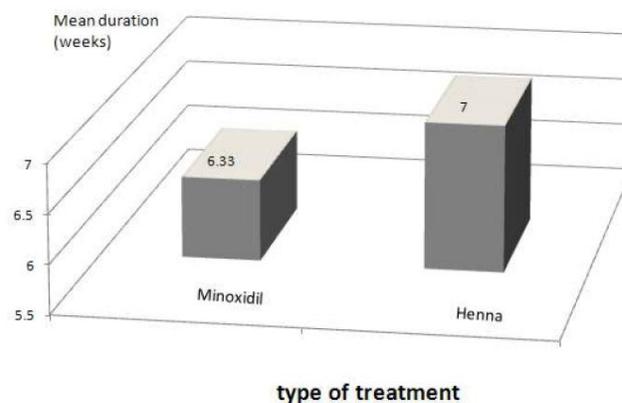
Both groups continued treatment until hair pull test had been negative.

Duration of telogen effluvium and evaluation of patients was evaluated by a dermatologist.

The data were statistically analyzed using Mann-Whitney and chi-square tests.

RESULTS

The mean age of all of the patients was 37 ± 7.9 (age range=25-40). In Minoxidil group, the mean age of patients was 35.92 ± 3.32 (age range=26-40). In Henna, the mean age of patients was 35.12 ± 4.32 (age range=25-40). There was no significant difference regarding age between the two groups. In Minoxidil Group the mean duration of TE was 6.33 weeks (SD=3.1, range=2-12 weeks). In Henna Group, the mean duration of disease was 7 weeks (SD=3.19, range=2-14



weeks). Statistical analysis showed no significant difference between duration of TE in the two groups (p value > 0.05).

Also, there was no significant association between the cause of TE and its duration ($p > 0.05$).

Causes of telogen effluvium in our patients were lactation (25%), dieting (26.7%), surgery (7.6%), stress

(15%), hypothyroidism (1.7%), hyperthyroidism (1.7%), malnutrition (1.7%), and drugs (6.7%).

The results of our study showed that duration of TE was reduced to 6.33 weeks in Minoxidil Group and 7 weeks in Henna Group (Figure 1). The minimum duration of TE was 2 weeks in both groups. The mean age of patients in the 2 groups was almost equal. Maximum duration of TE in the Minoxidil Group and Henna Group was 12 weeks and 14 weeks, respectively. No side effect was detected in any of the two groups.

DISCUSSION

There is no definite treatment for telogen effluvium (TE). However, Minoxidil has a theoretical benefit and is well tolerated in patients with telogen effluvium. The efficacy of this medication for TE has been shown in mice^[14]. Patients who are eager to play an active role in their treatment may choose to use minoxidil as a therapy^[13]. Minoxidil 2% and 5% can be useful in chronic diffuse telogen hair loss and chronic telogen effluvium^[6]. Genus *Lawsonia* bears one species, *L. inermis* (Henna, Mhendi, Shudi, Madurang, Mendi, Manghati, Madayantika and Goranti) having different synonyms as *alba* and *spinosa* belonging to family *Lythraceae*. Henna is used in traditional medicine to treat a variety of ailments as rheumatoid arthritis, headache, ulcers, diarrhea, leprosy, fever, diabetes, cardiac disease. The principal coloring matter of henna is Lawson, 2-hydroxy-1:4 naphthaquinone. Besides Lawson other constituents present are Gallic acid, glucose, mannitol, fats, resin (2%), mucilage and traces of an alkaloid. Leaves yield henna tannic acid and an olive oil green resin, soluble in ether and alcohol. Flowers yield an essential oil (0.01-0.02%) with brown or dark brown color, strong fragrance and consist mainly of α - and β -ionones; a nitrogenous compound and resin. Seeds contain proteins (5.0%), carbohydrates (33.62%), fibers (33.5%), fatty oils (10-11%) composed of behenic acid, arachidic acid, stearic acid, palmitic acid, oleic acid and linoleic acid. The unsaponified matter contains waxes and coloring matter^[15].

Methanol extract of henna leaves at 1 mg/ml concentration displayed immunostimulant action as indicated by promotion of T-lymphocyte proliferative responses^[16]. Naphthoquinone fraction obtained from

leaves *L. inermis* showed significant immunomodulatory effect^[17]. 2-hydroxy-1, 4-naphthoquinone (HNQ; Lawson) has antioxidant activity and inhibits the production of superoxide anion and substrate oxidation margin^[18]. This effect of henna is similar to that of *Foeniculum vulgare* that is effective in treatment of TE^[19], both have antioxidase activity^[20].

Leaves of henna have significant anti-inflammatory effect^[21,22].

Also, Extract of *L. inermis* improved wound healing activity in rats^[23].

Ethanol extract of the plant tissues that was evaluated in-vitro for protein glycation inhibitory activity using the model system of bovine serum albumin and glucose, showed significant effect on protein damage induced by a free radical generator in in-vitro assay system^[24].

All the above mentioned effect may play a role, but we don't know the exact mechanism.

Other herbal drugs like *Foeniculum vulgare*, *Matricaria recutita*, *Thymus vulgaris* and *Urtica dioica* have been reported effective in TE^[19].

The mean duration of TE is usually 3-6 months^[25]. The results of our study showed that duration of TE was reduced to 6.33 weeks in Minoxidil Group and 7 weeks in Henna Group. There are case reports of allergic contact dermatitis from henna^[26], but we had no side effect in our patients.

This finding confirms that henna is as effective as minoxidil in TE. Henna has other biologic effects such as Immunomodulatory, Antioxidant, Antibacterial, Antifungal, Antiviral, Analgesic, Anti-inflammatory, Wound healing and cancer prevention activities^[15]. In addition, many eastern are interested in henna, because of traditional believes, so it can be used instead of minoxidil, especially in eastern countries, for treatment of TE.

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