

POTENTIAL OF HERBALS AS ANTIDANDRUFF AGENTSSingla Chhavi^{*1}, Drabu Sushma¹, Ali Mohammad²¹Maharaja Surajmal Institute of Pharmacy, New Delhi, India²Faculty of Pharmacy, Jamia Hamdard, New Delhi, India

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*Chhavi Singla, Maharaja Surajmal Institute of Pharmacy, New Delhi, India Email: chhavi_mph@rediffmail.com**ABSTRACT**

The present article discuss about the clinical manifestation and mechanism of action of dandruff. The article also discusses in detail about various synthetic and herbal treatment methods available for dandruff. The status of dandruff being ambiguous – a disease/disorder, and therefore relatively less medical intervention is sought after for the treatment of dandruff.

KEYWORDS: Dandruff, Herbal treatments, *Pityrosporum ovale*, Scalp disease.

INTRODUCTION

Dandruff is a common scalp condition that occurs when dead skin is shed, producing irritating white flakes and possibly an itchy scalp. Ordinarily, dandruff results from excessive drying of skin and over- activity of the oil glands, known as seborrhea. Although dandruff is associated with the scalp, flakes may also appear on face, nose and eyebrows, as well as on the skin behind the ears, in the internal ear, and skin of trunk, particularly in creases.

Dandruff, which is visible desquamation of scalp is the mildest manifestation of seborrheic dermatitis and caused by *P. ovale* combined with multiple host factors. Dandruff is commonly aggravated by changes in humidity, trauma (scratching), season and emotional stress. Clinically, the greyish white flakes of skin are often very visible on the hair and shoulders. The other commonly associated symptoms of dandruff are itching with scalp soreness. The severity of dandruff varies from mild dandruff to exfoliative erythroderma. The differential diagnosis of dandruff includes conditions such as eczema, atopic dermatitis, candidiasis, contact dermatitis, dermatomyositis, drug eruptions, drug-induced photosensitivity, impetigo, lichen simplex, chronicus lupus erythematosus, nummular dermatitis, pemphigus, pityriasis rosea, tinea capitis, xerotic eczema, and vitamin B and/or zinc deficiency.¹

Mechanism of Action

Proinflammatory free fatty acids released by lipase activity of *Pityrosporum ovale* i.e. lipase-mediated hydrolysis of sebum triglycerides leads to an excess of oleic acid that aggravates the scalp^{2,3} and causes dermal inflammation and tissue damage. Another possibility is

that *Malassezia* may produce tryptophan metabolites which are active on the aryl hydrocarbon receptor, thus producing inflammation⁴. The age of onset suggests that an androgenic influence may be responsible, when the level of sebaceous activity is at its peak. Dandruff may improve in summer (as an ultraviolet ray from sunlight counteracts *P. ovale*) and may get worse in winter.

Dandruff has been shown to be the result of either:

1. Sebum or sebaceous secretions (*Pityrosporum* causes T-cell depression, that increases sebum levels and an activation of the alternative complement pathway¹²).
2. The metabolic by-products of skin micro-organisms (most specifically *Malassezia* yeasts)
3. Individual susceptibility

Other contributing factors include fatigue, emotional stress, acne, hormonal imbalances, constant exposure to dry air, trauma (scratching), season, use of lotions that contain alcohol, and neurological conditions such as stroke, head injuries and parkinson's disease. Dandruff is not, however the result of poor personal hygiene or use of a dirty comb.

Synthetic Treatments Available

Current treatment options available for the management of dandruff include therapeutic use of

- a. Zinc pyrithione (1-hydroxy-2-pyridinethiones and their salts, in particular the zinc salt),
- b. Salicylic acid,
- c. Imidazole derivatives,
- d. Glycolic acid, steroids,
- e. Sulphur,
- f. Selenium Sulphide,
- g. Tar derivatives
- h. Piroctone olamine,

i. Undecylenic acid derivatives

Sometimes switching to a less- drying shampoo is all that is needed to stop dandruff.

Herbal Treatments Available

Biotin, an important vitamin like nutrient that the body uses in many ways, is a major antidandruff compound. Naturopaths recommend getting 6mg/day for prevention and treatment of both dandruff and related condition seborrhea⁵.

1. Soybean (*Glycine max*)
2. Rosemary (*Rosmarinus officinalis*) tea or essential oils
3. Burdock (*Arctium lappa*)
4. Celandine (*Chelidonium majus*)
5. Comfrey (*Symphytum officinale*) tea
6. Ginger (*Zingiber officinale*) and Sesame (*Sesamum indicum*)
7. Licorice (*Glycyrrhiza glabra*)
8. Plantain (*Plantago major*) tea
9. Teatree (*Melaleuca*, various species)
10. Thyme (*Thymus vulgaris*) and Sage (*Salvia officinalis*)
11. Vinegar and Apple cider
12. Tea (*Camellia sinensis*)
13. Peppermint (*Mentha piperita*)
14. *Calendula officinalis*
15. Juniper (*Juniperus communis*)

1. Soybean (*Glycine max*) and other biotin containing food materials

Almost all the plants contain biotin to some extent, Soybeans contain the most, followed by garlic, American ginseng, oats, barley, Asian ginseng, avocado, cottonseed, alfalfa, sesame, corn, fava beans and elderberry. The amount of biotin required is 700mg/day.⁵

2. Burdock (*Arctium lappa*).

Burdock root oil massage into the scalp helps in treatment of Seborrhea.⁶

3. Celandine (*Chelidonium majus*)

Celandine works not only for dandruff but also for dry skin, hives, corns and warts. For preparing shampoo take one teaspoon of potassium chloride into six cups of water and heat it to dissolve, then add four ounces of fresh celandine (or half cup of dried herb) to the solution, leave the solution for two hours, then boil slowly for 20 minutes. Filter the solution and reduce the solution to two cups. Add eight ounces of glycerin and again reduce the liquid to two cups. This solution can be used twice a day as a hair rinse.⁷

4. Comfrey (*Symphytum officinale*)

Allantoin, the chemical present in this herb, has anti-dandruff properties. For preparing shampoo add a couple of drops of comfrey tincture to herbal shampoo.⁸

5. Ginger (*Zingiber officinale*) and sesame (*Sesamum indicum*).

Ginger and sesame is used for dandruff/seborrhea treatment in Egypt. For preparing the shampoo take one to two tablespoons of ginger juice and mix it with three tablespoons of sesame oil and a half teaspoon of lemon juice. This mixture can be used three times a week to rub into the scalp.⁹

6. Licorice (*Glycyrrhiza glabra*)

Dandruff can be controlled by keeping the oil production down. Glycyrrhizin present in Licorice can minimize the scalp's secretion of oils. Licorice also contains salicylic acid.^{10,11}

7. Plantain (*Plantago major*, and various species)

Like comfrey, plantain also contains allantoin. Boil plantain with water and use it as a hair rinse.⁵

8. Teatree (*Melaleuca*, various species)

Teatree oil, an antiseptic, contains substances known as terpenes that penetrate the top layers of the scalp and carry their disinfectant activities deeper than most emollients. Teatree oil, or any essential oil, can be poisonous internally as they are extremely concentrated.⁵

9. Thyme (*Thymus vulgaris*) and Sage (*Salvia officinalis*)

Thyme is used as a powerful antiseptic. Many herbalists recommend the old standard— one ounce each of dried sage and rosemary infused in two cups of water for 24 hours and used daily as a hair rinse. Adding a few drops of tincture of each of parsley, sage, rosemary and thyme herbs gives a good commercial herbal shampoo.⁵

10. Vinegar and apple cider

These both are used as old folk remedies for dandruff. Dried herb in vinegar can be used as hair rinse. Before shampoo apply the liquid directly to the scalp (warm one or both).

11. Tea (*Camellia sinensis*)

Tea contains astringent tannins together with phytochemicals like salicylic acid, sulphur and zinc responsible for antidandruff activity. For preparing shampoo take tea leaves (or tea bags) and make an extra strong infusion for an easy, effective after shampoo treatment for hair and scalp.¹¹

12. Peppermint (*Mentha piperita*)

Peppermint contains menthol, selenium and zinc, these are all proven antiflake ingredients available in commercial preparations.¹¹

13. *Calendula officinalis*

Salicylic acid present in *C. officinalis* is responsible for its antidandruff activity.¹¹

14. *Juniper (Juniperus communis)*

Menthol, selenium and zinc along with other antifungal agents are present in juniper. These are the ingredients also present in commercially available shampoos.¹¹

DISCUSSION

The synthetic treatment options available have certain limitations, which may be either due to poor efficacies or due to compliance issues. Furthermore, these synthetic drugs are unable to prevent recurrence, the common problem associated with them.

The best approach to treat dandruff is to use herbal antidandruff shampoo and go for a balanced diet. A combination of nutritional and herbal treatment should bring improvements in 6-8 weeks.

CONCLUSION

The herbal drugs prove to be an alternative for synthetic drugs having the shortcomings of poor efficacy, recurrence etc. The active constituents responsible for the antidandruff activity can be explored and further research may be done on these lead molecules for this activity.

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Fig 1: Scalp flaking known as dandruff. Note excessive flaking without overt irritation.¹³