

Comparative Study of Oral Administration and External Application of *Glycyrrhiza Glabra* Linn. w.s.r. *Varnya Karma*

Shilpa Kant Dwivedi*

* Faculty of Ayurveda, Dept of Dravyaguna Vigyan, Tania University, Shri Ganganagar

Abstract

Since long time, herbs and herbal products are used and new researches and discoveries are made in this direction to serve the humanity in a more better and affordable way. Ayurveda, the science of life has provided so much valuable information thus making it easy for the researchers to assess the proper source and follow proper guidelines in order to get fruitful results. In today's world of advanced science people still looks up to Ayurveda when it comes to the treatment of chronic disorders or beautification of skin, the main reason being the minimal adverse effects produced by these drugs. Among the large spectrum of beauty products the demand of herbal products is on a rise. People prefer drugs of plant origin for skin care due to their low costs, less side effects and wonderful results. *Glycyrrhiza glabra* Linn. is selected for the study of complexion enhancement viz. *Varnya* karma according to Ayurveda. The drug is selected from the *Varnya mahakashaya* of Charak samhita, sutrasthan, chapter four and it is also a valuable researched drug in modern cosmetic industry. Classical reference is to use it internally as kashaya for complexion benefits whereas now days it is a very popular drug used for skin whitening as an ingredient of creams and lotions. The work is to confirm and prove that for skin problems direct application of drug is more adept than systemic administration and herbs can be used directly for local requirement.

Keywords

Varnya, complexion enhancement, internal and external use, herbal cosmetics



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INTRODUCTION

Owing to so much concern of the people a wide range of products are launched in the market every years, amongst them a large number claim to be herbal in origin, but we all know that these products do have some chemical ingredients and adulterants which may have hazardous effects on skin. Therefore, there is a need for standardization of the content present in these products. Many of the chemicals in cosmetics and creams may in and of themselves breed free radicals (and the resulting inflammation) giving lie to their claims of being youth enhancing. Even more troubling is the preponderance of petroleum based chemicals and toilets and cosmetics. Additionally, a few studies have looked at the dangerous cumulative and inflammatory effect of combining so many different skin products over a lifetime.

In Ayurveda, we find so many drugs which are said to have *Varnya* karma. *Varnya* karma is to have a modifying effect on skin texture; it may include a positive effect on complexion, hydration, glow, elasticity, and removal of any type of skin discoloration¹. This action enhances the appearance of the skin but till now very little evidences are available to assert the efficacy of the drugs

described. So proofs are needed that the plants given in our ancient texts are really efficacious and contain the same properties as said.

Skin and Varna: Skin is involved in many functions as- thermoregulation, protection from physical and chemical injury and protection from invasion by microorganisms, manufacturing essential nutrients etc².

The skin represents an individual so everybody wants a healthy skin as it depicts a healthy body and a healthy mind. In Ayurveda, *Avabhasini* is the first out of seven layers of skin which shows the *prakrit* (normal) and *vaikrit* (abnormal) *varna* (complexion) of skin³. *Nyachha*, *vyang*, *tilkalak* etc. are concerned with the second layer or *Lohita*, others are involved in various disorders but the present work is restricted to the first two layers only. *Tejo Mahabhuta* (fire element) is responsible for *varnotpatti*. When it combines with various other *Mahabhutas* it gives rise to different skin colours like *Gaur*, *Krishna*, *Shyama* and *Gaurshyama*. Likewise, manifestation of *Krishna / Aruna* varna from vata dosha, *Pita* from pitta dosha and *Shukla* from kapha dosha occurs⁴. In modern science pigments like melanin and carotene are responsible for

skin colour, percentage of hemoglobin present in blood also affects the skin colour. The texture of skin varies with the dominance of doshas i.e. Vata: dry, rough, chapped dark skin, Pitta: damp, moist, with pimples, boils and fair skin and Kapha: moist, smooth, shiny skin.

Women have been using herbs since centuries as *Lepa* and *Udvardana* (packs) to obtain a fair and glowing skin. Today also, researchers in various fields are extensively working on various drugs for their multi-disciplinary actions in cosmetic field. Researches are also going on to select their specific effects as some of them are frequently used as components of skin whitening creams and are suggested to cause the inhibition of tyrosinase which normally converts tyrosine to melanin. Taking these points in view, a popular herb described as a *Varnya dravya*⁵ in classical texts viz. roots of *Glycyrrhiza glabra* having *Madhura*, *Sita*, *Snigdha* and *Vata Pittahara* properties is taken.

AIMS AND OBJECTIVES

1. To determine the *Varnya karma* of *Yashtimadhu* (*Glycyrrhiza glabra* linn.).

2. To study the comparative efficacy of the drug administered internally and applied externally on skin.

3. To show that cheap and easily available herbs profess to work better than expensive cosmetic products.

LITERARY REVIEW OF DRUG

Yashtimadhu (*Glycyrrhiza glabra* Linn.) have been used for skin problems since the ancient times, so adequate description of this drug is found in Vedas, Samhitas, Nigantu granthas etc. Along with these, it is also described in Kautilya krita Arthashastra and in other Ayurvedic literature. In the Atharva Veda, a drug described as *Madhudh* can be taken as *Madhuk* or *Yashtimadhu*. Twenty five synonyms of *Yashtimadhu* are mentioned at 293 places in Charaka samhita⁶, which denotes the broad spectrum use of its usage. *Madhuk* belongs to the *jeevaniya*, *sandhaniya*, *varnya*, *kanthya*, *snehopaga*, *vamanopaga*, *asthapanopaga*, *mutravirjaniya*, *daahprashaman*, *angamardprashaman*, and *shonitasthapan mahakashaya* in Charak samhita and have been said to possess *Varnya* property in the *agreya dravya prakaran*. In sushruta samhita, it is classified under *Haridradi*, *Vrihatyadi*, *Kakolyadi*, *Anjanadi*,

Ambashthadi, Nyagrodhadi and Utpaladi ganas⁷.

Yashtimadhu is an extensively used and researched drug. The main areas of research are related to its healing, anti-inflammatory and soothing properties. Pharmacodynamic evaluation reveals that it has a sweet taste; its potency is cold and has heavy (guru) and unctuous (snigdha) properties. The Vata shaman (inhibition of vata) karma of Yastimadhu is due to guru and snigdha guna and its pitta shaman (inhibition of pitta) karma is due to Sweet (madhura) and cold nature (sheet guna)⁸. Together with this due to expectorant (kaphanihsaraka) property it is also a kaphahara (kapha inhibitory). So, it is mainly Vatapittashamaka and Kaphanihsaraka. The main actions of this drug mentioned in classical texts are strength promoting, intellect promoting, good for throat, diuretic, blood purifier, rejuvenating, sperms producing etc. and the main diseases in which it is indicated are skin diseases, jaundice, greying of hair, urinary disorders, children's disease, diseases of head, weakness etc.

Glycyrrhiza glabra Linn.(Licorice) has been known in pharmacy for thousands of years. Licorice is also known as 'sweet root'. It is a perennial herb/subshrub for subtropical and

temperate zone. The root has few branches and its bark is brownish-grey to brown with longitudinal striations and bears traces of lateral roots. The cylindrical stolons are 1 cm to 2 cm in diameter, their external appearance is similar to that of the root but there are occasional small buds. The fracture of the root and the stolon is granular and fibrous. The cork layer is thin, the secondary phloem region is thick and light yellow with radial striations. The yellow xylem cylinder is compact, with a radiate structure. The stolon has a central pith, which is absent from the root. The external part of the bark is absent from the peeled root⁹.

It contains glycyrrhizin which is fifty times sweeter than sugar. It also contains isoflavones like glabridine, glabrene etc. The main pharmacological activities that are found are : corticosteroid activity, anti-ulcer activity, anti-bacterial, antifungal, anti-malarial, anti-viral, antibiotic activity, enzyme inhibitory, anti-hyperglycemic activity, memory enhancing effects, expectorant activity, spasmolytic activity, anti-allergic and anti-inflammatory activity, hepato-protective, anti-convulsant, anti-cancerous activity, activity on constipation and piles, estrogen balancing activity, anti-atherogenic and anti-cariogenic activity¹⁰.

VARNA CONCEPT

Twacha (skin) protects the body from various physical and chemical stimuli present in the environment. It does so by being a barrier between the body and the environment.

In Ayurveda, the skin is considered as an important ‘*updhatu*’ of *mamsa dhatu*. *Updhatu* is something which ‘bears’ (*Dharan*) the *sharir*. *Twacha* is also the location of *sparshanendriya* among the five *indriyas*. Structurally the skin is made up to six layers according to Acharya Charak and *Ashtang Sangrah*. But *Sushruta samhita* and *Ashtang Hridaya* counts seven layers of skin originating like *santanika* from milk¹¹, so there are certain controversies in Ayurvedic texts regarding the number of skin layers. In *Charak samhita*, *Sharir Sthan* three types of *varna* are described as *Gaur*, *Krishna* and *shyam*¹² whereas in *Indriya sthan* four types of skin colour are mentioned i.e. *krishna*, *shyam*, *shyamavdat* and *avadat*¹³.

Diseases affecting varna of the body:

Many diseases that affect pigmentation are described in Ayurvedic texts, majority of them come under *kshudraroga*. Out of all, the most important ones are *Nyachh*, *Vyanga*, *Mashak*, *Nilika*, *Tilkalak*, *switra* etc. These come under *jatottar varna vikaar*

as they are acquired during growth and aging due to environmental and nutritional factors. These develop due to the vitiation of *pitta dosh* due to *mithya ahaar* and *vihaar*. These factors disturb the normal physiology of *rakta dhatu* and skin thus causing pigmentation diseases. The main line of treatment for these diseases is *shiravedha/lepa/ abhyanga/udvartan* etc. These procedures increase blood circulation of the area concerned and the medicines applied act on vitiated doshas and normalize them. *Shastra karma* can be done when necessary for cosmetic purpose.

Complexion determinants of skin: The colour of the skin is derived from a variety of chemical and physical properties associated with the skin structure. Skin colour is mainly affected by two types of pigments (a) exogenous i.e., *Carotene*, *Lipochrome*, *Coal dust*, *minerals* and *tattoos* and (b) endogenous pigment i.e., *hemoglobin* and *melanin*.

Melanocytes are cell located in the *stratum basalis* of the *epidermis* and the *uvea* (middle layer) of the eye. *Melanocytes* produces *melanin* which is a pigment found in the skin, eye and hair. The *melanogenesis* causes long lasting tanning of skin as compared to tanning caused by already

existing melanin oxidation. Exposure to UV-B radiation causes an increased melanogenesis due to DNA photo damage. There are typically between 1000 and 2000 melanocytes per mm² of skin. They comprise from 5% to 10% of the cell in the basal layer of epidermis although their size may vary. They are typically 7 mm in length. The difference in skin colour among people is not due to number of melanocytes in their skin but due to the melanocytes level of activity. Eumelanin, pheomelanin and neuromelanin are the three types of melanin found in human beings¹⁴.

According to Ayurveda whatever brings softness, suppleness and beauty to the skin, provides luster and bring the discolored skin to the natural colour is termed as varnya, varna prasadan and varchasya dravya. The skin gets discoloured due to pathology in the doshas like Bhrajak pitta, Udana vayu, Avalambak kaph and Rakta. All of these have varnya karma under their specific actions. Acharayas have mentioned 'Oja' as the ultimate sara and its vitiation leads to disruption of natural complexion, to bring the skin to its natural colour Oja has to be increased. Oil glands in the skin keep it moist and protect it from the external environment and provides luster to the skin.

Sweat glands also keep the skin soft and hydrate it. Therefore, the drug classified under varnya dravyas brings bhrajak pitta, udana vayu, rakta etc. to their natural forms and quantity so that skin becomes fair, soft moist and lustrous.

MATERIALS AND METHODS

The roots of Yashtimadhu (*Glycyrrhiza glabra*) were collected from the fields of Chaudhry Charan Singh Agricultural University, Hisar in Haryana. The collected drug was identified by the authorities of the university. Then the raw drug was dried in shade for 4 days and then in electric drying oven for 2 hours for two days. After that it was grinded into a fine powder in the pharmacy of the university. It was packed in 100 gram plastic containers by the researcher and distributed to the volunteers as per the doses decided.

Forty volunteers were selected from the premise of National Institute of Ayurveda campus and from the people known to the researcher. Normal individual without any skin disease were selected. The individuals were divided into these groups-

- Those of group 1 were given powder to take internally with water.

- Those of group 2 were given the powder to apply as face pack externally on face.

Hundred grams of powder was given to the individual of each group at a time.

The volunteers of group 1 were asked to take half tea spoon full (approx. 2gm) of drug powder every day empty stomach with plain water. The volunteers of group 2 were asked to apply the lepa after washing their face with clean water once daily. They were directed to apply it on face until it completely dries. Then they are required to wash it away softly with plain water. Their skin types, skin condition and history were taken at that time. All the features of the skin were noted like freckles, wrinkles, scars, blemishes, pimples, blackheads, moles, any discolouration etc. The picture using a *high magnification skin camera* was taken to access the change after the trail. Various conditions of the skin were categorized and were marked according to their spread and localization. The complexion of the individuals was measured with the help of a beauty camera marking scale so that even a slight change in the complexion could be traced.

DISCUSSION

In Ayurveda a swastha purasa is considered beautiful. It says that when dosh, angi, dhatu, mala, atma, mind and indriya are in equilibrium then a person is healthy and thus beautiful. Owing to the present lifestyle it is rather becoming quite difficult to maintain the equilibrium among the above hence various ailments of the body, mind and skin are on a rise.

The main purpose of the present study is to know whether the present drug is effective practically and to make a comparison between its internal administration as referred by Ayurveda texts and external application of *Glycyrrhiza glabra Linn.* as used popularly. Yashtimadu is a perennial shrub commonly grown in north India. This drug was selected due to its sheer availability and its renowned usage. Yastimadhu is a drug in *Varnya mahakashaya* of Charak samhita, this drugs are said to have complexion enhancement property when taken internally. Comparison was made because in several researches it is found that the extracts of drugs are useful in skin whitening creams i.e. when applied externally. Comparison was been more precise as same part i.e. roots of the plant was taken for all the groups. The preparation chosen to be used in the clinical trial was

powder; it was taken as this particular preparation can be used in both ways i.e. externally and internally both. Other preparations like creams or extractive pills could have been taken but then due to interference of certain other substance used during preparing them could have altered the results to certain extents. Therefore this preparation was selected. Although the main problem with this selection was that the volunteers had to prepare the paste to apply every day and give at least 20 minutes for it to dry which was a tedious job. The taste of the powder is sweet so taking internally was not much a problem apart from those people who have difficulty in churna intake. The drug was taken along with plain water externally as well as internally so there was no interference of the carrier. The drug was selected to be applied externally and well as taken internally. Therefore, the probable mode of action has to be different for the different routes of administration. It is well known that any discolouration or deformity of the skin takes place due to vitiation of pitta dosh and rakta dhatu so any substance having varnya karma has to maintain the equilibrium and normalize pitta dosh and purify the blood.

When the drug is taken internally it works on the blood after digestion in the alimentary canal and absorption in the blood. Whereas when the drug is applied externally it works when it gets absorbed by the skin and therefore works on bhrajaka pitta. According to modern researches when the drug is used externally the chemical constituents present in it act variously on skin and melanin to cause skin lightening effects. Glabridin is the main compound in the hydrophobic fraction of licorice extract. It is known for its beneficial effects on the skin due to its anti-inflammatory and antioxidant properties. In addition, glabridin inhibits melanogenesis.

Glabridin may inhibit melanogenesis by one of two mechanisms:

1. Inhibition of the production of active oxygen species: (O₂)
2. Inhibition of tyrosine: Human tyrosinase is an essential enzyme, which regulates the production of melanin, a group of brown to black pigments in the skin and eyes of humans.

Yashtimadhu is vata pitta shamak thereby it normalizes the vitiated doshas in the skin, bring them to normal and thus cures the ailment caused by them, it bring these vitiated doshas in equilibrium and hence its

varnya action. Thus, this drug acts variously on pitta and rakta and bring them to normal condition. It purifies blood and enhances the glow and complexion of the skin therefore acts as a Varnya dravya.

Both the groups treated with the churna and lepa for one and a half months showed the effects related to the parameters. The preparations suited all the skin types. The lepa worked well in both dry and oily skin types causing no irritation or side effects. The group who took the powder internally also showed other results like regularization of bowel movements, reduced acidity and increased stamina. There was also marked effect of the environment and the habit of the subjects. Those who had to spend more time outdoors had lesser significant results than those who remained indoors long. The volunteers who took bland food had more profound effects than those who took spicy food. Many of the volunteers told that they feel good after applying the pack as it has a rubbing action also and smoothes the rough skin by exfoliation of dead cells. The scholar personally feels that those individuals who had more trust in the drug were benefited more than those who just went through it as a clinical trial. This may indicate that the skin responds more when there is faith in a

particular cosmetic. The trial period taken was of 45 days which is a short time to indicate noteworthy changes in the appearance of the skin. Hence more time should have been given to the trial to get clear results. The main three criteria that has been chosen for the evaluation are effects on complexion, hyper pigmentation and flatness i.e. smoothness of the skin which were measured by the highly magnifying beauty camera software.

There was not very significant effect on smoothness of the skin in volunteers of group 1 i.e. orally administered group; there was very significant effect on the members of group 2 on the flatness of skin with percentage change of 10.60. There was very significant change in hyper pigmentation in group 1 with percentage change of 15.38 and there were significant changes in group 2 with the mean difference of 13.64. There was insignificant result in complexion change in volunteers of group 1 whereas there was highly significant result in complexion enhancement of group 2 with a percentage change of 22.73. (Fig 1)

When the mean percent difference in symptoms of the individuals of the two groups were taken the overall results being interpreted as highly effective for a relief in

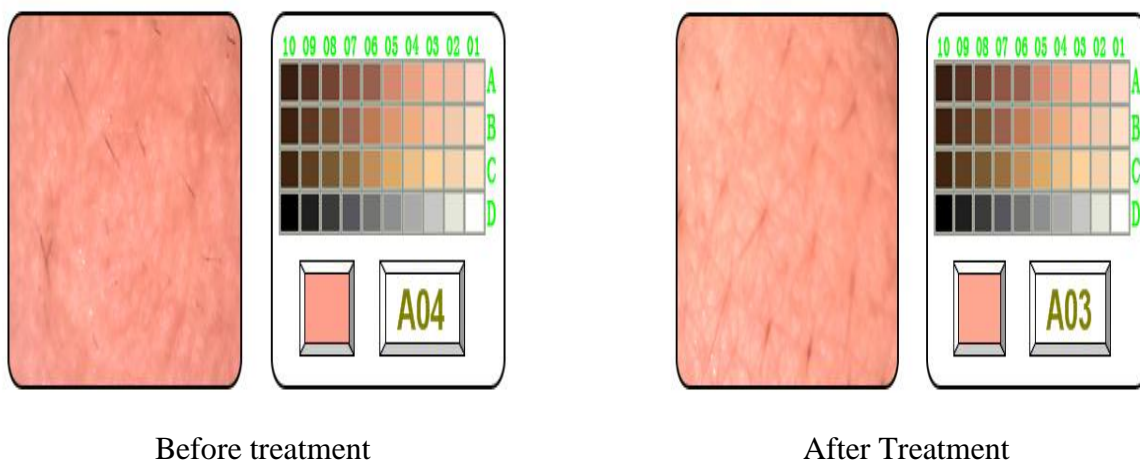
symptoms. Volunteers of group 1 showed a 7.81% of relief whereas volunteers of group

2 showed 19.90% relief. (Table 1)

Table 1 Pattern of change in complexion of 40 volunteers

Complexion	No. of volunteers	B.T.	A.T.	Diff.	% relief	S.D.	S.E.	t	p
Group 1	20	2.60	2.55	0.05	1.92	1.15	0.26	0.20	>0.01
Group 2	20	2.55	1.55	1.00	39.22	1.08	0.24	4.16	<0.001

Fig 1 Showing the change in complexion before and after external application of Glycyrrhiza glabra paste.



CONCLUSION

To conclude the study it can be said that the drug taken orally and externally both were found effective on skin conditions. External application works better in comparison to oral administration as the percent relief in symptoms was 19.90 in it whereas it was 7.81 in oral administration. Other than complexion, it had positive effects on blemishes, freckles, blackheads and wrinkles as well, hence could be used as ingredient in

preparations for these problems. Oral administration had effects on acidity, bowel movements and general wellbeing too. There was no significant effect on, til and moles, hypo pigmentation of skin. Those volunteers who had more faith in the drugs were most benefited.

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