



Review Article

APAMARGAKSHARA IN THE MANAGEMENT OF CERVICAL EROSION – A PHARMACOLOGICAL REVIEW

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ABSTRACT

Cervical erosion happens when cells that line the inside of cervix grow on the outside of cervix. That means the squamous epithelium of the cervix is replaced by columnar epithelium. Nowadays it is very common among women in reproductive age. The women with cervical erosion complaints of vaginal discharge, vulval itching, dyspareunia, low back ache etc. In the parallel medical field it is managed by electrocautery, cryotherapy and CO₂ laser vaporization. This condition can be correlated with *Garbhashayamukhagata Vrana* or *Karnini Yonivyapada*. In Ayurveda, it is treated by *Ksharakarma* along with internal medications. *Ksharakarma* itself is sufficient to clear the wound and to promote the healing process. This reviewing is done to know the pharmacological effect of *Ksharakarma* using *Apamarga Kshara*. It concluded that the procedure (*Ksharakarma*) and the drug used to perform the procedure (*Apamarga*) have the capacity to enhance the reduction of severity of the condition and gradually lead to the complete cure of the same. It is due to the efficacy of *Ksharakarma* to clear the unhealthy epithelial cells and the presence of wound healing components like tannins, flavonoids, antioxidants etc. in *Apamarga*. In effect it has equivalent result as modern management, cost effective, easy procedure, brief procedure, no or less complications, less chances for the recurrence of the same.

KEYWORDS: Cervical erosion, *Ksharakarma*, *Karnini*, *Garbhashayamukhagata Vrana*, *Apamarga Kshara*, *Achyranthes aspera* Linn.

INTRODUCTION

Cervical erosion is a condition in which the squamous epithelium of the cervix is replaced by columnar epithelium which is continuous with that lining the endocervix.^[1]

The prevalence of cervical erosion ranges between 17-50%. The condition is

- Increases with parity
- Decreases with age 35 and above
- Uncommon in post-menopausal women
- Can be found in up to 80% of sexually active adolescents
- Common in those who uses hormonal contraceptive pills.^[2]

Symptoms^[3]

- Increased vaginal secretion
- Mucopurulent discharge
- Vulval itching
- Blood stained discharge (few days before the menstruation)
- Bleeding per vagina on coitus

- Occasional bleeding per vagina on defecation
- Infertility
- Aching in lower abdomen, pelvis and low back
- Deep seated dyspareunia
- Bladder irritability

In most of the cases excessive vaginal discharge will be the symptom.

Diagnosis^[3]

It is mandatory to exclude the chances of malignancy in all such cases through proper per speculum examination and cytological examination of cervical smear (Papanicolaou test / Pap test)

On inspection it reveals,

- Affected area will be bright red in colour with clearly defined edge
- Hyperemia due to acute cervicitis
- Surface infection -multiple lesions lacking continuity with the endocervix
- Bleeds from multiple pinpoints on rubbing

Treatment^[3]

The management techniques are aimed to destruct the columnar epithelium, followed by formation of squamous epithelium in the affected area. It includes minor surgical procedures like

- Electrocautery
- Cryotherapy
- CO₂ laser vaporization

Cervical erosion can be correlated with *Garbhashaya mukhagata Vrana* or *Karnini Yonivyapada*.

Garbhashayamukhagata Vrana

There is no classical reference for such a correlation. But the basic details can define *Vrana* at the *Garbhasayamukha* and therefore it can be correlated with cervical erosion.

Karnini Yonivyapada

Considering the pathology and symptoms of cervical erosion, it can be correlated with the *Karnini Yonivyapada*. According to Charaka Samhitha,^[4] in the absence of labour pains, straining during labour will cause the obstruction of *Vayu* by fetus, with holding *Kapha* and getting mixed with *Rakta* produces '*Karnika*' in *Yoni*, which obstructs the passage of *Rakta* (*Rajah*). So the condition is termed as *Karnini*. Sushruta^[5] says that vitiated *Kapha* and *Rakta* produces *Karnika* in *Yoni*. Other features of vitiation of *Kapha* i.e., unctuousness and itching etc are also present.

Lakshana

1. *Yoni srava- Kandu- daha*
2. *Maithuna- Asahishnuta*
3. *Vedana - Kati and Yoni*
4. Infertility
5. *Moothrashayagatha vikara*

According to Susrutha Samhitha^[6]

"*Vran gathra vichurnane, Vranayathi ithi vranaha*" (Su.chi 1/6)

The term *Vrana* indicates a discontinuity in the healthy tissue of body. Among 14 types of *Vrana*, cervical erosion may be correlated as the *Sannipathiki Vrana*.

"*Shastra anushastrebhyah ksharah pradhanathamah chedyabhedyalekhyakaranaa*

tridoshagnatwath visheshakriyaavacharanaccha||"^[7] (Su.su 11/3)

Kshara is useful as a substitute for surgical instruments, because they can be used in patients who are afraid of operative procedures. Sushruta defined the *Kshara* as the substance possessing *Ksharana* and *Kshanana* properties.^[8] Explanation of these two words by Dalhana is.

- *Ksharan-* The one which mobilizes and removes the morbid skin, flesh etc or which removes the vitiated *Dosha* (Dalhana mentioned that a few authorities considered the reference as *Ksharana* means purification).^[9]
- *Kshanana-* Which destruct the deformed skin, flesh etc.

In the management of *Vrana* (wound), *Ksharakarma* included under *Shashti Upakrama* (the sixty measures of treatment of wounds). Sushruta has advocated the *Kshara Upakrama* for purification (*Shodhana*) of long standing ulcers having raised granulation tissue, hardness, itching, chronicity and which are difficult in cleansing.^[10] The main aim of *Vrana Shodhana* is to remove the dead tissue, keeping the wound bed free from unwanted and harmful material, thus minimising the reactionary inflammation.

Properties of Kshara

Guna: Na-atitikshna, Na-atishlakshna, Na-atimrudu, Na-atipichila^[11]

Doshaghna property: *Tridoshaghna*

Bahya Karma (Topical action)^[12]

- *Tridoshaghna* (Equilibrium of three vitiated *Doshas*)
- *Saumya* (Mild-Slow acting)
- *Dahana* (Burning)
- *Pachana* (Suppuration)
- *Darana* (Tearing)
- *Vilayana* (liquefaction and dissolving)
- *Shodhana* (Cleansing)
- *Ropana* (Healing)
- *Shoshana* (Drying and absorption)
- *Stambhana* (Astringent/ contraction action)
- *Lekhana* (Scaling)

Application of *Apamarga Kshara* in cervical area is a better alternative in the management of cervical erosion.

MATERIALS AND METHODS

Ayurvedic classics, lexicons, text books on gynecology and research publications were thoroughly reviewed to compile the information.

OBSERVATIONS AND DISCUSSION

Apamarga - *Achyranthes aspera* Linn

Apamarga is an erect stiff, annual-perennial herb. The plant is found throughout India in warmer and tropical regions as a weed. Acharya Caraka has included *Apamarga* under *Krimighna*^[13], *Vamanopaga*^[14] and *Sirovirecanopaga*^[15] groups.

Latin name: *Achyranthes aspera* Linn.

Family: Amaranthaceae

Parts used: *Panchanga* (The leaves, roots, seeds, stem, and fruits i.e., the whole plant).

Ayurvedic Properties [16-20]

Rasa: *Katu* (pungent) and *Tikta* (bitter)

Guna: *Laghu* (light), *Ruksha* (dry) and *Tikshna* (sharp) attributes.

Vipaka: *Katu* (pungent) in the post digestive.

Virya: *Ushna* (hot) potency

Effect on Dosh: It is *Kapha-vata shamana* and *Kapha-pitta samshodhaka*.

Karma: *Dahana, Pachana, Darana, Vilayana, Shodhana, Ropana, Shoshana, Stambhana,* and *Lekhana karma*.

Abhyantara Karma (systemic actions): It is diuretic, astringent and blood purifier. It is useful in the diseases like obesity, haemorrhoids, vomiting, abdominal pain, pruritis and diseases due to *Ama*.

Bahya Karma (local actions): *Shothahara* (anti inflammatory), *Vedanasthapana* (analgesics), *Lekhana* (scrapping), *Twagdosahara* (reduces skin pathology), *Vranashodhana* (cleansing of wound).

Achyranthes aspera

Phytochemical investigation has done by Vasudeva et al. in 2006, reveals that aqueous and ethanol extracts of leaves contain tannins, flavonoids, glycosides, and alkaloids. Thus, the enhanced wound healing may be due to the free radical scavenging action and immune-enhancing property^[21] of the plant.

Wound healing is a complex process, characterized by

1. Homeostasis
2. Re-epithelialisation
3. Granulation
4. Tissue formation
5. Remodelling of the extracellular matrix

Although healing process takes place by itself and does not require much help, but to avoid various complications like infection and the delay in healing, should pay attention to promote the process.^[22]

In 2005, research by Lopes et al. showed tannins have strong astringent property, which positively effects wound healing. It also promote capillary vasoconstriction and thereby reduce vascular permeability and cause a localised anti-inflammatory effect.^[23]

Flavonoids are well known for their antioxidant potential. Moreover, phytoconstituents like flavonoids are also responsible for wound healing potential. It is scientifically proven by Mukherjee et al. in 2000.^[24]

The importance of antioxidants in removal of damaged tissues is revealed from the study done by

Singh et al. in 2006. Antioxidant activity contributes to the cicatrisation of wounds, because the free radicals can damage cell structures including membrane lipids, proteins, enzymes, and nucleic acids. So a scavenging effect is the most important component of wound healing. The antioxidant enzymes are known to quench radicals and, thus prevent the damage of cells caused by free radicals.^[25]

Content of Apamarga Kshara- Apamarga Panchanga- Pharmaceutical analysis^[26]

The pharmaceutical study of *Apamarga Kshara* was done in the 'Oasis Test House Limited' Jaipur an 'ISO 9001' certified lab. It was analysed for identifying the inorganic acid and basic radical sand pH of a water suspension. The *Apamarga Kshara* was found strongly alkaline in reaction (pH of 5%w/v solution in water-10.44) and hygroscopic. Its strong alkaline nature was responsible for the corrosive action i.e. destruction (slough off) of columnar epithelium, and the re-epithelisation of squamous epithelium.

In 2012, invivo wound-healing efficacy and antioxidant activity of *A.aspera* in experimental burns was studied and the result clearly demonstrated that the methanol extract of *A.aspera* has a definite prohealing action in burn wound healing by increasing the rate of wound contraction, augmented antioxidant level and total protein contents in the granulation tissue, which was also supported by histopathological study.^[27]

Scortichini & Pia in 1991 proved that triterpenes are known to promote wound-healing mainly due to their astringent and antimicrobial character.^[28] As the methanol extract of *A.aspera* contains triterpenes (study by Barua et al. in 2010), it might contribute for the wound contraction, increased rate of re-epithelialization and angiogenesis in healing tissues.^[29]

A major protein of extra-cellular matrix, collagen contributes to wound strengthening is proven by Singer & Clark in 1991.^[30] Increase in the hydroxyproline content is seen in granulation tissue of the animals which are treated with *A.aspera* and thereby enhanced collagen maturation and increased cross-linking. After treatment with *A.aspera*, levels of different enzymatic and non-enzymatic antioxidants increased significantly and it suggests decreased oxidative injury in the wound tissue could be due to increased scavenging of oxygen free radicals by the elevated levels of antioxidants.^[27]

Key players in every phase of the healing process is Matrix Metallo Proteinases (MMP) why because, it eliminate damaged protein and provisional extracellular matrix, facilitate migration

to the centre of the wound, granulation tissue remodelling, controlling angiogenesis and also regulation of some growth factors (Inkinen et al., 2000).^[31] Increased expression of MMP-2 and 9 in the study suggested that the plant extract has an important role in remodelling of the extra cellular matrix.^[27]

Probable mode of action of *Kshara* in non-healing ulcer^[32]

A review done on the topic - Utility of *Apamarga Kshara* in non-healing chronic ulcer in 2005 explains that,

1. **Tridoshaghna**- Helps in equilibrium of localized vitiated *Tridosha* and hence promote the process of healing.
2. **Saumya and Dahana**- *Saumya* property is one of the characteristics of *Kshara*, attributes that *Kshara* acts only on the deranged, unhealthy and hypertrophied tissues. *Saumya* property and *Dahana* property of *Kshara* are complimentary to each other. The *Kshara* in particular is moulded during its preparation itself to have both these qualities in a therapeutically useful chemical structure.
3. **Pachana**- Fastens the inflammatory process which is nothing but encouraging the anti-bodies to fight against antigens.
4. **Darana**- Helps in opening or rupture of the abscess.
These properties help in resolving the swelling or convert them into abscesses for further (*Shodhana*) debridement.
5. **Sodhana** - Helps in elimination of unwanted and harmful substances from the wound.
6. **Ushna and Tikshna guna**- Desquamation of sloughs (debridement) and draining of pus will be easier.
7. **Ropana**- After attaining this debridement of unhealthy tissues, *Kshara* will enhance the process of *Ropana* or healing of *Vrana* due to its antiseptic property. Healing requires new vascularisation, granulation tissue formation and lastly in pouring of proteins and fibrocytes for the formation of healthy tissue which is taken care by *Ropana* property of *Kshara*.
To promote the healing process moisture from the ulcer bed should be removed; otherwise it facilitates breeding and growth of micro organism.
8. **Soshana**- Helps in drying up and absorption of mucous discharge and thus promoting the granulation. *Kshara* being in the form of ash acts as an absorbent (hygroscopic), so that ulcer

becomes relatively aseptic and healing is fastened.

9. **Sthambhana**- Helps in coming together of the opposing edges of an ulcer to promote active healing.
10. **Vilayana**- Helps in liquefaction and dissolving of localised unhealthy tissues.
11. **Lekhana**- The fibrosed tissue in the edges of chronic ulcer hampers the healing process. The *Tikshna Guna* of *Kshara* scraps the site of fibrosis. Thus when fibrosis is sloughed out the process of healing becomes faster.

CONCLUSION

The Ayurvedic management of cervical erosion is effective through the *Kshara karma* using *Apamarga*. The procedure and mode of action are almost equivalent to the Allopathic surgical management. *Ksharakarma* and the drug used to perform the procedure (*Apamarga*) have equal role to enhance the complete cure condition. It is due to the efficacy of *Kshara karma* to clear the damaged epithelial cells and the presence of components like tannins, flavonoids, antioxidants etc in *Apamarga* to improve the healing process. In effect it has equivalent result as modern management, cost effective, easy and brief procedure, no or less complication, less chances for the recurrence of cervical erosion.

Besides that *Kshara karma* seems to be safe, easy method, short procedure, cost effective, less chances for complications and re-emergence of the condition. So the controlled cauterisation by *Apamarga Kshara* is effective in the management of cervical erosion.

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Cite this article as:

Neetha Surendran, Anita K Patel. Apamargakshara in the Management of Cervical Erosion- A Pharmacological Review. *International Journal of Ayurveda and Pharma Research*. 2020;8(12):31-36.

Source of support: Nil, Conflict of interest: None Declared

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