



**IJAYUSH**  
*International Journal of AYUSH*  
AYURVEDA, YOGA, UNANI, SIDDHA AND HOMEOPATHY  
<http://internationaljournal.org.in/journal/index.php/ijayush/>

International Journal  
Panacea  
Research library  
ISSN: 2349 7025

Review Article

Volume 10 Issue 02

March – April 2021

## NIRJANTUKARANA (STERILIZATION): A BRIEF OVERVIEW

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### ABSTRACT

We, Human beings, are surrounded by microorganisms. The relationship among humans and microbes is inextricable. On the one hand, some microbes live among us as commensal and co evolve while on the other hand, some may cause infectious diseases e.g., Staphylococcus lives on about 25% of healthy people, according to the Center for disease control and prevention. Some strains (e.g., Staphylococcus aureus) of this bacterium cause many ailments such as boils, which is very common and here comes the role of sterilisation. As the world is fast approaching the post antibiotic era, in which pathogens that cause healthcare-associated infections are becoming better at resisting antibiotic and antifungal substances that were once quite effective, not only in surgery or hospital wards but it is mandatory in daily living in the present scenario. It has been used since Vedic period. Guggulu(*Commiphoramukul*) Dhoopana is mentioned in Atharva Veda. Acharya Sushruta and other ancient masters were very keen observers and they included this technique from the very beginning. Techniques like Dhoopana, Raksha karma etc. are mentioned in various texts in various places. Ayurvedic techniques are cost effective and can be used by common people without dealing with side effects and they help to maintain immunity in a natural way.

**Keywords:** Nirjantukarana, Rakshkarma, Dhoopana, kandugna, krimighna Mahakashya,

## INTRODUCTION

Among Shashthi Upkrama, Vranadhoopana, Ksharkarma and Agnikarma mentioned by Sushruta also hold their importance in sterilization.

In Chikitsasthaan, AcharyaSushruta mentioned technique to prevent infection of ulcer caused by flies using Rakshoghnadravyas.<sup>[4]</sup>

मक्षिका व्रणमागत्य निःक्षिपन्ति यदा क्रमीन्। श्वयथूर्भक्षिते तैस्तु जायते भृशदारुणः॥ (सु.चि.१/११९)

In Sutrasthaan, he mentioned fumigation technique using Sarshapa(Brassica nigra), Nimbapatra(Azardiractaindica), Ghee, Lavana (Sodium Chloride) twice for 10 days in order to prevent infection of ulcer.<sup>[5]</sup>

सर्षपारिष्टपत्राभ्यां सर्पिषा लवणेन च। द्विरहनः कारयेद् धूपं दशरात्रमतन्द्रितः॥(सु.सू.१९/२८)

SushrutaSamhita is Shalyapradhaangrantha, it describes various surgeries like, anorectal, abdominal, gynecological etc. along with description of many Yantras and Shastras and as we are well aware, the success of surgery depends on the proper sterilization. Sterilization of instruments, hospital wards, surgical rooms, Sutikagara, Kumaragara etc. should be done by various Dhoopana and Rakshoghnadravyas.

AcharyaDalhana said that there is no fear of infection and contamination of wound if instruments and accessories are well sterilized.<sup>[6]</sup>

अग्निसेनशस्त्रेणछिन्द्यात् अन्यथा अतप्तशस्त्रच्छेदनेपाकभयस्यात् | डल्हण

Sushruta also mentioned recitation of protective hymns to counteract sorcery (Kriya) and the dread of evil spirits (Raksasa), serpent demons (Naga), devils (Pishacha), celestial musicians (Gandharva), souls of paternal ancestors (Pitra), spirits (Yaksha), evil spirits (Nishachara) etc. In the same context Sushruta further spoke about the protection of strength, intellect, psyche, and understanding from the blessing of God Indra, Manu, Gandharva and Varuna respectively.<sup>[7]</sup>He further advocated Yama and Niyama as a part of Rakshakarma.<sup>[2]</sup>

Sushruta described MishrakGana like Arkadi, Patoladi, Aragvadhadi, Eladi which are used for disinfection.<sup>[8]</sup>

The description of Dincharya includes various herbs for mouth cleansing e.g., Karanj (Pongamiapinnata), Nimba etc. that are disinfectants.<sup>[9]</sup>

The description of various types of Bandha suggests that our ancient masters were very well aware of bacterial infections.

Regarding neonatal care, Sushruta directed the newborn to be wrapped in Kshauma (linen cloth). Twigs of Pilu, Badar, Nimba, Parushak are to be used to gently fan the baby. Tailpichu (tampon impregnated with oil) should be applied over baby's forehead daily and fumigation of Sutikagara should be done by Rakshoghnadravyas.<sup>[10]</sup>

AcharyaKashyapa dedicated whole chapter regarding Dhoopana Karma i.e., DhoopaKalpa. He mentioned various formulations of fumigation, out of which one is RakshoghnaDhoopaFor Protection Containing Various Drugs Such as *Ghruta*(Ghee), *Siddhartaka*(Brassica alba), *Hingu*(Ferula foetida), *DevNirmalya*(Flowers of Herbs Offered to God), *Akshata*(Unbroken Rice), *SarpaTvak*(Shed Skin Snake), *BhikshuSanghati*(Saffron Color Cotton Cloth).<sup>[11]</sup>

घृतं सिद्धार्थको हिङ्गु देवनिर्मल्यमक्षता। सर्पत्वग्भिक्षुसंघाटी धूपो रक्षोघ्न उच्यते ॥

(का.स.कल्प धूपकल्पोध्याय)

Concept of *Dhoopana* is broad in *Kashyapa*. he also used *Dhoopas* for prevention and curing paediatric diseases especially when demons, ghosts or devils started harassing young children, facilitating proper development of children.

AcharyaCharaka described about Dhoopana and Rakshavidhaan in Chikitsasthaan, he describes that Dhoopana done using aromatic herbs along with Ghrita (Ghee), Majja (bone marrow tissue) and Vasa (fat) reduces pain, secretion, foul smell and kills microbes in the wounds.<sup>[12]</sup>

कठिनत्वं व्रणा यान्ति गंधै सारैश्च धूपिताः ।

सर्पिर्मज्ज्वसाधूपैः शैथिल्यं यान्ति हि व्रणाः ॥

रुजः स्रावाश्च गंधाश्च क्रिमयश्च व्रणाश्रिताः ।

शैथिल्यं मार्दवं चापि धूपनेनोपशाम्यति ॥

(च.चि. २५/१०८-१०९)

Charaka also mentioned VranashodhakKashaya for VranaPrakshaalana in the same chapter. It includes Amla (Phyllanthusemblica), Haritaki (Terminaliachebula), Baheda (Terminaliabelirica), Khadirtwaka (Sanegalia catechu), Daruharidra (Berberisaristrata), Nyagrodha (Ficusbengalensis), Bala (Sidacordifolia), Kushmoola (Desmostachyabipinnata), Leaves of Nimb (Azardiractaindica) and Badar (Ziziphusmauritia).<sup>[13]</sup>

त्रिफला खदिरो दावी न्याग्रोधादिर्बला कुशः |

निम्बकोलकपत्राणि कषायः शोधनः मतः ||

(च.चि.२५/८४)

Charaka also mentioned about Antahparimaarjana and BahirparimaarjanaDravyas for internal and external purification respectively in Sutrasthaan e.g., various Lepa and Pradeha for management of skin infection and different Mahakashay like, Kandughna, Krumighna, Vishaghna etc. for the same.<sup>[14]</sup>

Charaka mentioned about purification methods of air, water, and soil in an independent chapter named Janpadodhwamsa (epidemic), these can be grouped under preventive methods.<sup>[15]</sup>

Drugs like Kataka (Strychnospotatorum) are used for purification of water. Charaka also described Hamsodaka in his text.<sup>[16]</sup>

Describing Dincharya in SutrasthaanCharaka mentioned about herbs like Karanja (Pangomiapinnata), Karvira (Neriumindicum),Arka (Calotropisgigantea) etc. that are disinfectants.<sup>[17]</sup>

In Vishachikitsa, Charaka describes many methods of fumigation in order to prevent spread of poison and also there is formulation for killing serpents, rats, insects and tiny insects of clothes.<sup>[18]</sup>

Under Rakshakarma, Charaka gives detailed description related to protection of newborn related to antisepsis of beddings, clothing, and aseptic measures to prevent infections from surroundings. All around the Sutikagara (labour room), the twigs of Adani, Khadira (Acacia catechu),

Karakandu, Pilu (Salvadorapersica), Parushaka should be hung, and Sarshapa, Atasi, Tandula, Kan-kanika should be scattered on its floor. A packet containing Vacha, Kustha, Kshomka, Hingu, Sarshpa, Atasi, Lasuna, Guggulu etc. Rakshoghanadravyas should be hung on the door and similar dravya should be tied around the neck of mother and the child. Well-wishing care taker women should be remained vigilant and attentive in the Sutikagara for the initial 10-12 days.<sup>[19]</sup>

Acharya Vagabhatta also stated Rakshakarma with reference to Vrana Shodhana in Uttartantra describing management of infected wounds by Surasadi Gana and Aragwadhadhi Gana along with Nimba, Patol etc.<sup>[20]</sup>

सप्तसु क्षालनाद्येषु सुरसाऽऽरम्बधादिकौ ।

भृशं दुष्टे व्रणे योज्यौ मेहकुष्ठव्रणेषु च ॥

अथवा क्षालनं क्वाथः पटोलीनिम्बपत्रजः। अविशुद्धे, विशुद्धे तु न्यग्रोधादित्वगुद्भवः ॥

(अ.ह.उ. २५/४१-४२)

He further stated Dhoopana with Jau (Hordeumvulgare), Ghrita, Bhurjapatra (Betulautilis), Devdar (Cedrusdeodara), Gandhabiroja (Paederiafoetida) destroys microorganisms infesting wound and allow wound to heal properly.<sup>[21]</sup>

वाताभिभूतान् सास्त्रावान् धूपयेदुग्रवेदनान्

| यवाज्यभूर्जमदनश्रीवेष्टकसुराह्वयैः॥

(अ.ह.उ. २५/४५)

Regarding Neonatal care, Acharya Vagabhata describes similar procedure as Charaka, in addition he also mentioned use of herbs like Brahmi (Bacopamonnieri), Indrayan (Citrulluscolocynthis), Jeevak (Crepediumacuminatum) and Rishbhak (Malaxismuscifera) to be tied around hands and neck of newborn.<sup>[22]</sup>

Description of Balvacha for increasing Medha, Smriti, Longevity and Health of child is one of his unique idea.<sup>[22]</sup>

Moreover, he also explains fumigation of killed crow with Sarpi (Ghee), Vasa and Majja for fumigation of clothes.<sup>[23]</sup>

While explaining preventive measures, Acharya Vagabhata in Ashtangasangraha mentions to cover mouth during sneezing, laughing or yawning in order to prevent any kind of contamination and infection of wound.

In Uttarsthana, in the chapter named Shastrakarmavidhi, he also refers to Dhoopana of wound with herbs like Guggulu (*Commiphora wightii*), Agar (Aquillaria malaccensis), Ghrita, Sindhava, Vacha (*Acorus calamus*), Sarshapa (*Brassica campestris*), Hingu (*Ferula foetida*), Sarjarasa (*Shorea robusta Gaertn*) and Nimbpatra for protection of wound from contamination.<sup>[24]</sup>

He also mentioned about fumigation technique for Kumaragara using dried crow feathers along with Vacha (*Acorus calamus*), Kushtha (*Saussurea lappa*), Trivarta (*Operculina turpethum*), Sarshap (*Brassica campestris*), Srivesta (*Pinus roxburghii*) with Goghrita.<sup>[25]</sup>

## DISCUSSION

All of the methods that are described above holds their importance in every scientific aspect. Most of the herbs used for Dhoopana (Fumigation) and Rakshakarma are pungent, astringent and bitter in taste due to their chemical composition and hence, they possess insecticidal and antibacterial properties. In a recent study it was found that plants protect themselves against being eaten by secreting natural pesticides and other toxins, plant-based phenols, flavonoids, isoflavones, terpenes, and glucosinolates. These different chemicals are almost always bitter, pungent, or astringent in taste. In addition to their bactericidal or biological activity these substances may provide a defense against predators by making the plant unpalatable.<sup>[26]</sup>

Ayurvedic fumigation technique holds several advantages as there is ease of drug administration, higher bioavailability and high potential to penetrate blood brain barrier.<sup>[27]</sup>

Many Acharyas also referred nasal passage as ‘the passage to the brain’.<sup>[28]</sup>

The combination of several herbs suggests efficacy by providing synergistic effect to the main ingredient.

Dhoopnadavyas are mostly Agni and VayuMahabhootpradhan. These are Laghu, Sheeta, Ruksha and Vishada in nature. These qualities help in their rapid spreadability and quicker combustion. Most of the Dravyas are volatile in nature. Their volatility would be a distinct advantage in lowering microbial contamination in air.

There are ample examples regarding antimicrobial properties of herbs like Nimba (Azadiractaindica), Guggul (Commiphorawightii), Sarshapa (Brassica compestris), Haridra (Curcuma longa), Tulsi (Ocimum sanctum), Vacha (Acoruscalamus), and many more.

For e.g., The essential oil, chloroform extract and seven sesquiterpenoids compounds newly isolated from the oleogum-resin of Commiphorawightii(Guggul) showed a wide range of inhibiting activity against both Gram (+) and Gram (-) bacteria. This suggests the antibacterial activity.<sup>[29]</sup> Acoruscalamus Rhizomes(Vacha) was found to have antimicrobial activities on various microorganisms including bacteria, yeasts and filamentous fungi.<sup>[30]</sup> In a study, Staphylococcus aureus showed high level of inhibition of 100% in 10 min and 50% in 5 min to the fumes of Azadiractaindica showed maximum of 90% inhibition rate.<sup>[31]</sup> Brassica species contains contrasting profiles of glucosinolates which have biocidal activity on different pathogens including bacteria and fungi.<sup>[32]</sup>

Moreover, hymn chanting and homa in the room of patient is kind of psychological counselling to make the patient positive, comfortable and feel safe.

This process also supports the mother during post- partum phase to avoid any kind of stress. Recent studies add to growing evidence that psychology impacts wound repair, and highlight in particular the positive role of social support on modulating the negative effects of stress.

## CONCLUSION

Since Vedic period Homa-Havana and Yagya, sterilization of air by Agnihotra, sterilization of house & place around it by Dhoopana, is going on traditionally. Dhoopana has also been mentioned for its antimicrobial and growth promoting activities for the healthy production of plants in Vrikshayurveda. Dhoopana and Rakshakarma has broad spectrum of aesthetic, spiritual, psychological and medical significance. Use of spices in our food, use of animal excreta to drive away insects etc. all suggests importance of traditional methods in our daily lives without facing any kind of side effect.

Ayurveda have always been criticized for lack of standard protocols. Sterilization is the most primary of all regarding which no doubt, Ayurvedic texts are filled with ample examples regarding the topic. The DhoopanaDravyas have a lot of potential to manage different diseases and for sterilising in an economical and eco-friendly way without developing any drug-resistant microorganisms. Frequent use of chemicals causes many disorders and we can save ourselves from them in very simple and economical way. Researches are going on in order to cope up with organisms that are basically cannot be seen unaided, I think Ayurvedic methods are worth a try.

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