

Application of *Dhoopan Karma* in present scenario- a review

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Abstract:

We are surrounded by billions of microorganism. Most of them are not harmful, or are opportunistic which may attack in hosts and children. They may prove harmful in neonatal wards or labour room. Thus proper disinfection and sterilisation is always a major concern especially in neonatal wards. The bacterial flora differ from place to place and with time, which has developed resistance to modern disinfectant procedures. Ayurveda has provided an elaborated explanation of many herbal drugs which may prove to be safe, effective, and lucrative in present settings. In the present study five such drugs which are explained in *Kashyapa Samhita* for *Dhoopana karma* namely *Nimb*, *Guggul*, *Sarshapa*, *Nirgundi*, and have been studied for their anti-bacterial and disinfectant properties. All drugs have been found to be effective and safe in neonatal wards.

Keywords: antibacterial, Ayurveda, *Dhoopana*, disinfectant, fumigation .

Introduction:

We are living in environment which is surrounded with billions of microorganism. These microorganism almost contribute nearly 37% of our house hold dusts. Maximum of them lives in human body with compensation, and are not harmful, or are opportunistic. Which may prove dangerous in immune-compromised hosts and children. Some potential harmful bacteria like gram positive cocci, staphylococcus aureus living in nostrils of 30% population.¹

This microorganisms can prove dangerous in open wounds, in operation theatre settings, in neonatal wards or in labour room, where host is not able to defence themselves against these pathogens. They may enter and cause disease in the hosts. Thus proper disinfection is a major aspect². The bacterial flora is dynamic in nature, differ from place to place and changes over time, which can make resistance for modern disinfectants.

Ayurveda deals with both the preventive and curative aspects of disease. Ayurveda have mentioned the treatment modalities as topical (*bahiparimarjana*), systemic (*antaparimarjana*) or by surgical intervention (*shastrapranidhan*). In global scenario the importance of Ayurveda is because of its holistic approach towards positive life style. *Dhoopana karma* (medicated smoke) creates an aseptic environment, kills microbes and thus, prevents infection. *Dhoopana karma* categorised under topical (*bahiparimarjana*) treatment, has been told in all the classics of Ayurveda but detail description is available only in *Kashyapa Samhita* in a chapter named *Dhoopkalpa*. This paper is foot step in the efforts to establish probable mode of action of *Dhoopana* to improve the health of children from various diseases and preventing the need for medical intervention, by studying pharmacological properties of various Ayurveda drugs which are mentioned for *Dhoopana karma*.

Importance of *Dhoopana karma*

Dhoopana is one of the measure that mentioned for the maintenance of internal and external environment of man. *Dhoopana* is an inseparable part of therapeutics in Ayurveda. *Dhoopana* is method by which herbal drugs, herbo-mineral or animal origin drugs are used for fumigation to heal *Vrana*, *Yonivyapada*, *Karnarogas*, *Nasarogas*, *Gudarogas*, *Gatra-dourgandhya*, to disinfect *Bheshajagar*, *Vranagar*, *Sutikagar*, *Shashtra-karmagruha*, *Kumaragar* etc. and also used to sterilise *Asavas* and *Arishtas*. Since *vedic* period

sterilisation of air by *agnihotra*, sterilisation of house and place around it by *homa*, *Havana* and *yagnya*, is going on traditionally.³ *Dhoopana* has also been mentioned for its antimicrobial and growth promoting activities for the healthy production of plants in *vrikshayurved*. *Dhoopana* has broad spectrum of aesthetic, spiritual, psychological and medical significance. *Yogaratanakar* has mentioned *nimbakashtadhoopa* to be used as a contraceptive.

Technique

The formulations generally consist of drugs that show a synergetic effect and help in propagating the activity of the main antimicrobial drug.

Ayurvedic fumigation is an example of drugs delivery through the inhalation route having several advantages. It includes ease of drug administration, higher bioavailability and high potential to penetrate the blood brain barrier.

Mostly *agni* and *vayumahabhoot Pradhan dravyas* are used for this procedure. These qualities of the *dravyas* help in its rapid spreadability and quiker combustion. In nature these druds are *laghu*, *sheeta*, *ruksha* and *vishada*. Most of the *dravyas* are volatile in nature. Their volatility become advantage in lowering microbial contamination in air and on difficult to reach surfaces. Researches have shown that volatile oils, which often contain the principle aromatic and flavouring components of herbs and spices, if added to food stuffs, would cause no loss of organoleptic properties, would retard microbial

contamination and therefore reduce the onset of spoilage. Furthermore, evidence suggests that these oils possess strong antioxidant activity.

Total 94 formulations are mentioned in texts. The number of ingredients for a *dhoopana* formulations varies from single drug to a number of drugs.

Probable mode of action

It dilates blood vessels and help in oxidation of blood. It leads to adequate tissue perfusion and oxygenation. Thus, reduces inflammation, itching and eliminates infection.

Drugs used for *dhoopana karma*

Plants belonging to *kushthahara*, *krimighna*, *kandughna*, and *vranaharagana* have mostly been used for their anti-microbial properties. Minerals having sulphur compounds *haritala* and *manashila* have been used. Animal products like hairs, nails, horns etc. have been used where keratin is a structural component which contains sulphur. The sulphur present in these substances might play a key role in the disinfection. The use of excreta of different animals may have been used as the smell of it may drive away major vectors of disease like mosquitoes, worms, maggots and other insects. Dry animal excreta have also been used as a source fuel. Animal excreta mainly contains combustible gases. Likewise, most of *dravyas* have substances like ghee, *sarjarasa* to help in combustion.⁴⁻⁷

- *Guggul* has been mentioned in 15 formulations

- *Ghee* in 41 formulations

- *Sarjarasa* in 13 formulations

- Excreta in 20 formulations

Nimba(*azadirachta indica*)

Its active constituents possess insecticidal and insect repellent activity, like 22, 23-dihydronimocinol extracted from leaves, and azadirachtin extracted from seeds. *A. indica* fumes against streptococcus pyogenes after 10 minutes exposure showed 100% inhibition and 50% inhibition after 5 minutes exposure, it also showed inhibition of *s. aureus*, *s. epidermis*, and *p. aeruginosa* under same setting. *Azadirachta indica* is effective against head lice in topical use.⁷

Fumigation of volatile oils of *azadirachta indica* have potent insect repellent property. An olfactometer study carried out with the volatile oils of leaf of *a. indica* have shown 73% repellent activity at a dose of 80mg.⁸

Guggul (*commiphora wightii*)

Extracts of *guggul* were evaluated for their potential antibacterial activity against both gram positive and gram negative bacterial species of clinical significance. Ethanol extract was found to have comparatively higher activity than other organic and aqueous extracts of *guggul*. Gram positive bacteria showed competent but variable susceptibilities to all the tested extracts. Some of the extracts exhibited significant inhibitions of bacteria even at low concentrations.⁹

Sarshap (*brassica campestris*)

Brassica species contain contrasting profiles of glucosinolates which have biocidal activity on different pathogens including bacteria and fungi. Fumigation with brassica species is effective against nematodes.¹⁰

***Nirgundi* (vitex nigundo)**

Petroleum ether (60-80°C) extracts of the leaves of vitex nigundo were evaluated for larvicidal activity against larval stages of culex tritaeniorhynchus in the laboratory. Larvae of C. tritaeniorhynchus were found more susceptible. It provided protection from mosquitoes bites, which varied between 98.8% and 100%. In the field trial, it was found that the leaf extracts of v nigundo offered protection from the three major important vector mosquitoes such as anopheles, culex, and aedes species. The larvicidal efficacy is comparable to fenthion, a commercial available organophosphorus larvicide.¹¹

***Tulsi* (ocimum sanctum)**

Extracted essential oils such as methyl chavicol, eugenol linalool, camphor and methyl cinnamate and some biologically active constituents that are insecticidal, nematicidal and fungi static. Extract obtained by oil extraction also showed good antibacterial activity. This can be mainly due to the presence of eugenol, a phenolic compound, which has been reported to have antimicrobial properties on multidrug resistant shigella strains. The essential oil has larvicidal activity against houseflies and mosquitoes. essential oil and its component like linalool having

antifungal activity specifically against candida.¹²

Conclusion

This paper was aimed at reviewing the antibacterial and anti-infective activity of various Ayurveda drugs mentioned in *Kashyapa Samhita* for *dhoopana* and their role as a main line fumigation therapy for preventive and curative aspects among children. The review reveals that the plants *nimba*, *guggul*, *sarshap*, *nirgundi* and *tulsi* possess potent antibacterial activity and therefore can be successfully used in fumigation therapy both as mainline treatment and for prophylaxis with minimal adverse effects. With the help of this paper the drugs which are quoted will prove to be beneficial for the researcher planning clinical trial with them and they can be used in neonatal wards and operation theatre as an effective, safe alternative to present day disinfectants used in fumigations.

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