

**DHUPANA KARMA: A DRUG DELIVERY METHOD****Dr. Manita Ahlawat\*<sup>1</sup>, Dr. Reetu Sharma<sup>2</sup> and Dr. S. K. Mandal<sup>3</sup>**<sup>1</sup>PG Scholar, Dept. of Roga & Vikriti Vijnana, NIA Jaipur.<sup>2,3</sup>Assistant Professor, Dept. of Roga & Vikriti Vijnana, NIA Jaipur.Article Received on  
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Vikriti Vijnana, NIA Jaipur.**ABSTRACT**

Drug delivery system is an important part of pharmaceuticals. It has a significant role in imparting the efficacy to the drug. In context of Ayurveda therapeutics, a comprehensive description is available regarding the mode of drug delivery. *Panchavidha kashaya kalpana* lays the foundation of Ayurveda pharmaceuticals indicating the form and dosage of drug to be used. With the course of time, new derived forms of drug were discovered and added to this. This is accompanied with discovery of new modes of drug delivery. Neither section of Ayurveda classics deals with the direct description of drug delivery methods as a

whole. But the review of the texts gives a picture of vivid methods starting from the oral route (like *Vati*, *Swaras*) to intanasal therapy (*Dhumpana*), topical administration (*Lepa*, *Pradeha*, fomentation therapy etc.), rectal route (*Basti*, *Varti*), oil therapies like *Shirodara*, *Shiroabyanga*, *Shiropitchu*, *Shirovasti* and *Shiropralepa* in which drugs are delivered by the transcranial route. In the same context, a new technique has been found known as *Dhupana* which can be considered as an additional drug delivery method in Ayurveda science. It is the administration of drugs in fumes form. The present study entails the detailed description about this new mode of drug delivery i.e fumigation therapy covering its various aspects. Ayurveda classics along with modern literature, web references, published research articles are referred for the study. On review of literature, it is found that *Dhupana* serves as promising approach in drug delivery system.

**KEYWORDS:** Drug delivery, *Dhupana*, fumigation therapy.**INTRODUCTION**

*Dhupana* (fumigation)<sup>[1]</sup> is a type of traditional therapy vividly explained in our classical texts. It is the procedure of burning herbal drugs and using the generated fumes/smoke for

incensing, perfuming or any medicinal purpose. An ample of literature is available regarding various *Dhupa* formulations. This technique involves exposure of patient to the medicated fumes thus it can be taken as a drug delivery method. The basic requirement for the effective administration of drug depends on the drug composition, the nature of its active constituents, its palatability and absorbance in body, its diffusability, and penetration of drug molecules to the targeted sites, stability and safety. And all these factors are greatly influenced by the route of administration. The *Dhupana* technique is adopted for those drugs having volatile compounds which easily get liberated on reaching a specified temperature.

## MATERIAL AND METHODS

The various aspects of *Dhupana karma* as drug delivery technique are described as below:

### Principle

*Dhupana karma* is modified form of *Havana karma* & is assumed to work on the same principle. In *Havana*, various medicinal herbs are ignited in fire in *Agnikunda*, an inverted pyramid shaped container. It is based on the scientific principle. The conversion or transformation of herbal/plant medicinal preparation into vapour phase leading to release of medicinal phytochemicals is controlled by amount of drug/ *Havana Samagri*, frequency of use and even specific shape and size of *Agnikunda*.<sup>[2]</sup> The mantras chanted during *Yagya* transmit various sonic signals and electromagnetic waves which intensify the desired benefits of *Yagya*. Our Acharya might have taken this concept to switch over a novel drug delivery method. Various drugs when burnt over a desired temperature, efficacious fumes enriched with active ingredient of the drugs are released. These fumes then can be used either for localised or systemic purpose.

### Drug form

- ✓ The drugs are taken in coarse powdered form and put into fire and thus fumes are produced.<sup>[3]</sup>
- ✓ **Curna<sup>[4,5,6]</sup> form:** Powder of various mentioned *Dhupana* drugs can be used. Powder of drugs is placed in earthen pot and is mixed with goat's urine and then ignited for formation of fumes.
- ✓ **Kalka<sup>[7,8]</sup> form:** *Kalka* or paste form of *Dhupana* drugs is taken in a *Sarava samputa* and then it is placed over fire. The fumes so produced are projected outside through a pipe fitted in the hole of that *samputa* and are used for *Dhupana karma*.

- ✓ ***Dhupavarti***<sup>[9,10]</sup>: Although reference of *Dhupana karma* using *dhupavarti* is not directly available in the texts but in *Caraka Indriya Sthana* smell of *dhupavarti* is used as simile of poor prognosis.

### Instrumentation

#### ***Dhupana yantra***<sup>[11]</sup>

There is description of apparatus used for fumigating wound in Ayurveda texts. It consists of an instrument in which the pipe should be eight fingers long, having blunt mouth, thickness of *Kalaya* and a hole of horsegram size.

Modern fumigating machines are based on this traditional layout.

### Fumes physiognomies

- ✓ A study reported that medicinal smoke contains nanoform of carbon or any other active molecule. This nanoform enriched with active components of the medicinal herbs magnifies the advantage of the desirable phytochemicals and thus enhancing the efficacy of medicinal property of the smoke.<sup>[12]</sup>
- ✓ The volatile constituents of herbal drugs gets vaporised at their boiling points and this gaseous form gets easily diffused at the target site. The smoke acts as a vehicle for spreading the active constituents.
- ✓ According to a previous research, 'smoke extract'<sup>[13]</sup> is formed on burning of medicinal plant. This smoke extract is assumed to have superior antimicrobial activity (in terms of having lower minimum inhibitory concentration (MIC) values than the corresponding solvent extracts and essential oils). This study provides in vitro evidence for inhalation of medicinal smoke as an efficient mode of administration in traditional healing.

**Rational behind use of *Ghrta* in *Dhupana* formulations:** All *Dhupana* formulations contain *ghrita* as an important ingredient. The rationale behind its use may be its beneficial activity in enhancing the qualitative and quantitative aspect of fumes production. The Ghee helps in rapid combustion of cellulose of wood (herbal drug). The fatty acids get volatilize easily. Acetone bodies, pyruvic aldehyde and glyoxal etc. are result of combustion of glycerol portion. The hydrocarbons produced in the reactions again undergo slow combustion and as a result methyl and ethyl alcohols, formaldehyde, acetaldehyde, formic acid and acetic acids are formed.<sup>[14]</sup>

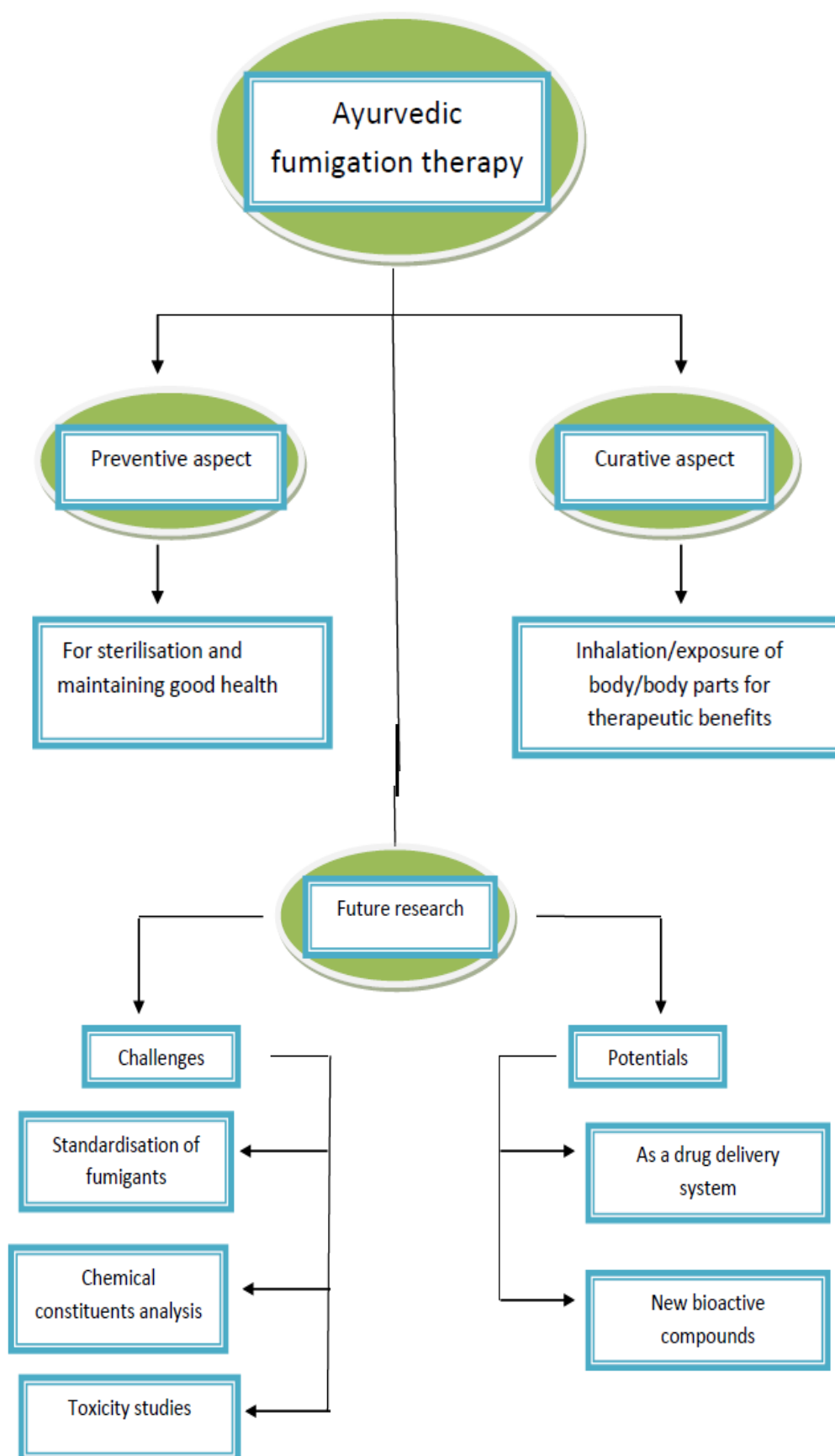
**Easy diffusion and deeper penetration:** Most of the components of *Dhupana* have volatile oils that volatilize with high temperature of *Dhupana*. The medicinal herbs & ghee are vaporised in *Dhupana* and it might be responsible for better diffusion of active constituents of drugs in body cells with deeper penetration to the target and hence it may be responsible for better drug delivery in fumes form.

Previous researches report that the nose, lungs and the pores of the skin serve as portal of entry for vaporised form of medicinal herbs. This method might prove to be easiest, least risky and effective administration of drug constituents to reach every single cell of the body.<sup>[15]</sup>

## DISCUSSION

The previous researches on ethnopharmacological aspect of *Dhupana* supports the fact that active constituents of any drug are qualitatively rich in fumes form as compared to their other extract and solvents form thus enhancing the drug efficacy. Sechul Chun et al in their study reported that the NC@TS (which is the nanocarbon material harvested by centrifugation from the turmeric smudge) was also functionalized with reputed antimicrobial essential oil components that exist in turmeric.<sup>[16]</sup>

Also this technique is incorporating various challenges and scopes in it as reported by Chethala N. Vishnuprasad in his study.<sup>[17]</sup>



**Fig. 1: Challenges and scopes of *Dhupana Karma*.**

## CONCLUSION

The *Dhupana Karma* may serve as an effective method of drug delivery in the upcoming time. The need is to research more over its standardisation and instrumentation. The development of tools to make better use of this technique is required. So we should focus over this under noticed method of traditional system of medicine.

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