

An Advance Innovation of Dosage Form of Ayurveda

Abhinav Kumar Sharma¹, Manoj Kumar Yadav², Piyush Yadav³
^{1,2,3}*Department of pharmacy, Prasad institute of technology, Jaunpur*

Abstract - The concepts of drug placement and drug management approach play a very important role in the regulation of drugs in nature. Selection of appropriate dosage forms and quantity of drug control play an important role in determining the desired medication sequence. In Ayurveda the word Kalpana corresponds to various measuring forms i.e.; liquids, semisolids and solid equilibrium forms. Kalka, Vati, Bhasma, Asava / Arishta, Kwatha and Churna, etc. It is a variety of dosages used in the treatment of ayurveda mainly for the purpose of internal drug administration. A specific form of dosage for a certain amount of duration of repetition provides the desired results without adverse events. Deviations in drug administration or insufficient frequency of administration may result in a lack of treatment response or toxic effects. Given the importance of the concept of "dosing dosing" the current article summarizes some of the key points related to the various Ayurvedic forms and their proposed value for the management of patients of different ages.

INTRODUCTION

Ayurveda is a science of life. It is mainly based on the Trisutra, Hetu, Linga and Aushadhi. Among these Aushadhi plays a major role in the treatment. Aushadhi acts as an aid for the other branches in Ayurveda. Aushadhi is used to maintain a good health as well as to cure diseases in humans. It is mainly administered according to the condition and convenience of the patient. In Ayurveda there is a description of different dosage forms which have been explained nearly 5000 years ago. These are explained in classics for the purpose of making it compatible without losing the potency or efficiency of the drugs. It has been explained in a systematic manner considering all the aspects like Desa, Kala, Bala etc. In classics it is mentioned that different dosage forms can be made by the Yukti of the physician involving principle of Samyoga or Vibhagato convert into another dosage form. Also the potency of a drug can be increased or decreased by the same. Kala and Samskara play a very important role in drug collection

and augmenting the potency of the drugs. In classics they have also mentioned about the ideal qualities of a drug. It should be suitable for preparing many recipes, should possess the gunas and should be readily available. The total number of dosage forms told in Ayurveda is not told by any other system of medicine.

HISTORICAL BACKGROUND

Historically the Ayurvedic Pharmaceutics can be divided in two distinct streams - namely 'Aarsa' and 'Siddha', however the two streams merged into one, making the distinction invisible with the passage of time. History of the 'Aarsa' stream dates back to period of Vedas (5000 B.C.) whereas the 'Siddha' stream was considered to have been active around 8th century A.D., the period of second 'Naagaarjuna' although the period of first 'Naagaarjuna' can be traced back to 100 B.C. (Siddhinandan Misra-1990). The 'Aarsa' stream followers although used minerals and metals for their drug requirements; such use was very rare. They prepared their drugs principally from plants whereas 'Siddhas' not only initiated use of minerals in combination with plants but also instituted drugs prepared solely from minerals. Thus they were instrumental in opening a new generation of mineral and metal based drugs giving birth to a new branch of Ayurvedic discipline termed as 'Rasa shastra'. The word 'Bhaisajya Kalpanaa' is specifically used in relation to preparation of plant based drugs although literally it encompasses preparation of any type of drug. An independent article is being prepared on Rasa Saastra hence this article will only deal with Ayurvedic pharmaceutics of plant based drugs.

PRINCIPLES OF AYURVEDIC PHARMACEUTICS

The pharmaceutical procedures for any drug involve various steps starting from identification and collection of authentic raw material, application of

standardized processing techniques, and production of quality drug to packaging and storage of the produced drug. Ayurvedic pharmaceuticals is not an exception to this. A quote from Caraka Samhitaa (Caraka Samhitaa Vimana Sthaana 8/87, 1984) says raw material of specified type having specific characteristics and therapeutic action, grown on a specific soil in a specific geographical area in specific atmospheric conditions should be collected in a specific season. Only such raw material will produce the expected therapeutic effect provided it is used judiciously in proper dose. Saarangadhara-states (Saarangadhara Samhitaa Purvakhandaa 1/6, 1983) that the plant material should never be collected from dirty, marshy and gravel filled places. The plants growing in a graveyard or on a footpath should also not be collected. Raw material which is infected, burnt or chilled also is not likely to produce the expected therapeutic effect and hence should not be collected. He further adds that autumn, the 'Sarada Ritu', the first two months succeeding the rains as per the Indian calendar being ripening time for most of the plants, is supposed to be the best season for collection of all types of plant material, whereas plants specifically used for induction of purgation and emesis should be collected at the end of spring. As described above every substance in the Universe possesses a potential to become a drug. But not all the parts of the substance are always therapeutically useful in view of the specific diseased state. In such a situation the therapeutically useful part of the substance needs to be separated out and put to therapeutic use. The therapeutically useful part is termed as 'Saara Bhaaga' in the terminology of Ayurveda (Cakrapaanidatta 'Ayurveda Dipikaa' 1984). This can be achieved through specific processing. Many a times the substance may contain more than one therapeutically useful constituent. Different procedures may be required to separate out such useful constituent. The components soluble in water are extracted in water whereas solvents like fat, oil or alcohol are required to extract ingredients soluble in those solvents. A combined solvent system is also used sometimes. Depending on the requirement, different procedures are adopted to extract therapeutically useful ingredients. Water being universal solvent is used for majority of extractions. Since the plant material used for drug preparation is very similar to food material the cooking practices such as heating, boiling, frying

etc. are used in pharmaceutical procedures as well. Fresh as well as dried plant material is used for processing- depending on availability and necessity. Different procedures are adopted to prepare a dosage form, which is stable for a longer period. Thus the type of pharmaceutical processing depends on following factors:

1. Nature of the raw material : fresh or dry
2. Required concentration of the dosage form
3. Solubility of therapeutically useful component of the plant
4. Heat stability of therapeutically useful component of the plant
5. Route of administration
6. Shelf life of prepared dosage form.

The Ayurvedic formulations range widely from freshly extracted plant juice to eye drops, ointments, surgical threads etc. However there are five basic classical forms termed as 'Pancavidha kasaaya' (Saarangadhara Samhitaa - Madhyama Khanda 1/1, 1983) from which all other drug formulations or forms are derived or developed. The five basic forms are : 'Swarasa' the expressed juice, 'Kalka', a fine paste obtained by grinding fresh or wet grinding dried plant material, 'Kwaatha', the decoction, 'Sheeta' or 'Hima', the cold water infusion and 'Faanta', the hot water infusion. The first two forms are prepared from freshly collected plant material and are directly put to patient use, whereas the last three forms 'Kwaatha', 'Sheeta' and 'Faanta' are aqueous extracts prepared from the dried plant material. The basic principle behind preparation of these 'kasaayaas' is that the plant as a whole or any part of the plant as a whole may not be useful for the expected therapeutic action. Not all but some of the plant ingredients are therapeutically active. These ingredients have to be extracted from the plant and put to therapeutic use. Water being comparatively inert universal solvent is used as a media for extraction of such active ingredients from the plant. Three types of extraction techniques, depending on the heat sensitivity of the plant material, are used. The extracts so obtained are termed as 'Kwaatha', 'Faanta' for extraction with hot water and 'Hima' for extraction with cold water. The water insoluble plant material is separated and thrown out as a waste material at the end of all these extraction processes. According to some authorities (Cakrapaanidatta 'Ayurveda Dipikaa'- Caraka Samhitaa Sutra 4/7 - 1984) use of specific extraction

system depends on the target disease condition, the target patient and the source substance. Some of the plants require specific extraction technique for obtaining expected therapeutic action e.g. (Caraka Samhita Cikitsaa Sthaana 1/3/31- 1984) Centella asiatica (Linn) 'Mandookparni' and Tinospora cordifolia (Thunb) Miers 'Guduci' should be used only in the form of expressed juice for their 'Rasayana' effect and Convolvulus pleuricaulis Choisy- 'Shankhpushpi' should only be used in the form of paste (kalka). It is apparent that the expected plant ingredients having specific therapeutic action of above mentioned plants will be destroyed if other procedures of extraction are utilized because of the sensitive nature of the related plant ingredients. In all these extraction methods water soluble active ingredients of the plant are extracted. The concentration of the active ingredient extracted in the solvent water differs in each of the methods (Cakrapaanidatta 'Ayurveda Dipikaa'- Caraka Samhita Sutra 4/7 - 1984). The concentration declines in descending order with reference to 'Swarasa', Kalka', 'Kwaatha', 'Hima' and 'Faanta'. 'Swarasa' possesses highest concentration where as 'Faanta' possesses the lowest. They are put to use depending upon the condition of the patient with respect to his digestive capability e.g. 'Swarasa' should only be used when the general condition of the patient is good otherwise the drug is likely to be harmful. Children and elderly may not be suitable for receiving the 'Swarasa', the expressed juice, whereas for a robust individual- 'Faanta', the hot water infusion may fall short of yielding the expected effect. The disease status also plays an important role in deciding the form of the drug. Severity of the disease invites use of concentrated drug forms.

The different types of dosage forms as mentioned in Figure 1 offers following advantages:

1. Solid dosage forms give palatability, long half-life and easy to administered.
2. Liquid dosage forms offer good bioavailability and good for pediatric care.
3. Semisolid dosage forms posses longer contact time when applied topically and effectively penetrate through skin to systemic circulation

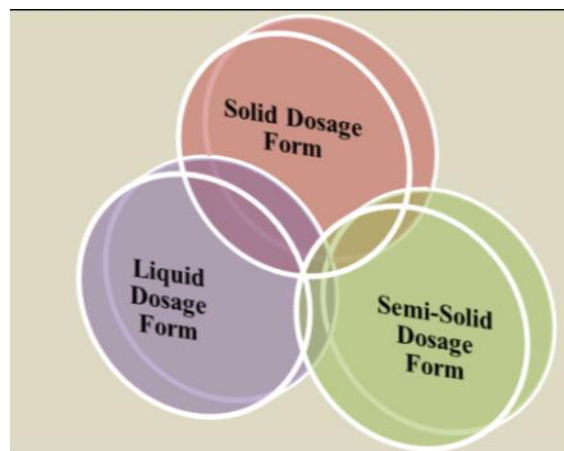


Figure 1

PROCESS OF MANUFACTURE

Ayurvedic medicines are available in the form of powder, tablets, pills, liquid and semisolid which are classified into the following different categories

1. Aristha and Asavs
2. Rasa Rasayan
3. Lauha
4. Bati
5. Churna
6. Avaleha
7. Ghrita
8. Parpati
9. Taila
10. Goggulu

METHOD OF PREPARATION

Aristha and Asava

Asavas and Aristhas are made by soaking the herbs either in powder form or in the form of decoction (kasaya) in a solution of sugar or jaggery, as the case may be, for a specific period of time, during which it undergoes a process of fermentation generation alcohol and facilitates the extraction of the active ingredients contained in the herbs.

Rasa Rasayan

Ayurvedic medicines containing mineral drugs as main ingredients are called Rasa rasayan or Ras-yoga. They are in pill form or in powder form/ forest, minerals such as Anrala, Swarna, Rajata, Tamra etc. and sulphur impurified state are used to convert bhasma form, called kajuali then other drugs are added

in small quantities, mixed well and grounded to form fine powder.

Lauha

Lauha kalpas are preparation of Loha Bhasma as main ingredient with other drugs. The other active ingredients are made to fine powder and mixed with Loha Bhasma.

Vati or Gutika

Medicines prepared in the form of tablets or pills are known as vati or gutika, these are made of one or more drugs of plant, animal or mineral origin.

Churna

Churna is a fine powder form of drugs. All these herbs and other active ingredients are cleaned, dried and powdered together by mechanical means to the fineness of at least 80 mesh.

Avaleha Madak Paak

Avaleha or lehya is a semi-solid preparation of drugs. These are prepared by the addition of jagger sugar or sugar dandy and boiled with prescribed drug juices decoction, Honey, if required, is added when the preparation is cold and mixed well.

Ghrita

Ghrita are preparations in which ghee is boiled with prescribed Kasayas (Decoction) and kalkas of drugs according to formulation as per Ayurvedic formulary.

Parpati

First Kajjali is prepared with purified Mercury and sulphur. Then other drugs as per Ayurvedic Formulae are added and mixed well in grinder. The powder is then heated in iron vessel and melted. This melted material is purified as per Ayurvedic method, cooled and again flakes of medicines are powdered.

Taila

Tailas are prepared by boiling prescribed kasyas (decoction) and kalkas of drugs in oils according to the formula prescribed in Ayurvedic formulary.

Goggulu

Ayurvedic medicines prepared by the exudates, and obtained from the plant commiphara mukul, are known as Goggulu. There are five different varieties

of Goggulu in Ayurvedic Shastra but usually two varieties, mahiskasa and kanaka are preferred for medicinal preparation.

Exudates in small pieces are taken in a piece of cloth and boiled in gomutara or Dugdha or Triphala kasayua until the exudates pass into the fluid through the cloth to the maximum. The fluid after filtering is boiled till it forms a mass. After drying, the mass is formed into a paste by adding ghee till it becomes waxy.

COMMON EVALUATION PARAMETER FOR THE AYURVEDIC DOSAGE FORM

Taxonomical estimation: - Authentication of drug material.

Organoleptic/sensory evaluation: - Color, odor, appearance, powder particle size distribution, powder flow, clarity.

Foreign matter: -Foreign plant, own plant, another animal, mineral. Microscopic evaluation: -

Qualitative: -palisade ratio, vein islet, vein termination, stomatal index, stomatal number.

Qualitative: - lycopodium spore count method, starch grain, calcium oxalate crystals.

Chromatographic & other methods: -HPLC, TLC, HPTLC, UV-spectrometry, GC-MS.

Physiochemical parameters: -PH, Disintegration time, friability, hardness, sedimentation rate, solubility, viscosity, ash value, extractive value, volatility, oil related values, swelling index, foaming index, melting range, optical rotation, moisture content.

Pharmacological parameter: -Bitterness, astringent activity, antimicrobial activity, hematological activity, antioxidant activity, nitric oxide scavenging activity.

Toxicological parameter: - Limit test, pesticide contain, heavy metals, aflatoxin, radioactive, bioburden.

CONCLUSION

All the Kalpanas which have been speak briefly in Ayurveda are mostly focus at isolation of suitable active principles between different media such as water, oil and ghee. These different feature have to be regard in the preparation of formulations such as samyoga, vishlesa i.e., combination and separation of different drugs keeping into consideration factors like kala, samskara etc. The various kalpana as explained is formulated to achieve increased shelf life, increased

potency and greater palatability along with its application of modern technology. I would like to conclude that the selection of the various dosage forms is left to the Yukti of the Bhishak as per the needs of the patient.

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