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CONCEPTUAL REVIEW OF *VATI KALPANA* (SOLID DOSAGE FORM) IN *AYURVEDA*

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ABSTRACT

In *Ayurveda* several *Acharyas* have been added or modified the different formulations or preparations according to their own experiences from time to time without violating the basic principles, to find out the most potent drug to prepared different formulations of herbal, herbo-mineral compounds in various form. *Vati Kalpana* is a pharmaceutical procedure in which the powder of raw drugs are triturated together with certain *Kashaya* or Juice or even honey and the medicines are prepared in the form of pills or tablets. Main objective of this study is to review the *Vati Kalpana* dosage form. References regarding *Vati and Guti Kalpana* were collected from various classical and *Ayurveda* published works, published research papers and concept of *Vati* and *Guti Kalpana* was studied in details. *Vati Kalpana* is the concept which is highly accepted by *Ayurveda* in ancient and modern era because of its easy way of preparation and having the potency received after *Mardana* and *Bhavana*. In general practice, the highly accepted common dosages form is *Vati* as it is available due to enumerable production and palatable nature.

KEYWORDS: Ayurveda, Tablet, Vati Kalpana, Bhaishajya Kalpana.

INTRODUCTION

The success of any treatment plan depends on *Roga Rogi Chatushpada* in Ayurveda. The importance of drugs come after physician in the sequence of *Chatushpada*. In *Ayurveda* several *Acharyas* have been added or modified the different formulations or preparations according to their own experiences from time to time without violating the basic principles, to find out the most potent drug to prepared different formulations of herbal, herbo-mineral compounds in various form. In this way new formulation and new dosage forms development was already in *Ayurveda* practice from *Vedic* time to modern era according to availability of the raw drug, known properties of the compound / ingredients, specific therapeutic area. Different *Samkaras* (Procedures or Modifactory Procedures) like grinding, pounding, heating, frying, boiling etc. was carried out to potentise the drug action, to enhance the shelf-life of the drug / drugs, to improve the palatability and to fulfil the patient's compliance. *Vati Kalpana* is a pharmaceutical procedure in which the powder of raw drugs are triturated together with certain *Kashaya* or Juice or even honey and the medicines are prepared in the form of pills or tablets. Main objective of this study is to review the *Vati Kalpana* dosage form.

MATERIAL AND METHOD

References regarding *Vati and Guti Kalpana* were collected from various classical and *Ayurveda* published works, published research papers from Pub Med, Google Scholar and compilation was done. Concept of *Vati* and *Guti Kalpana* was studied in detail and conclusion was drawn.

REVIEW OF LITERATURE

In the *Clinical Practice of Ayurveda* there are several types of *Kalpanas (Dosage forms)* which are available through pharmaceutical company as medicine and similarly those medicines are also prepared by physician in different *Kalpanas* in their day to day practice. A quote from *Caraka Samhitaa Vimana Sthana* 8/87 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.[1] In *Ayurvedic* Pharmacopoeia, all the preparations are explained after classify them under two broad headings.

1. Fundamental / Basic / Primary Preparations.

2. Secondary Preparations.

Fundamental preparations are *Panchavidha Kashaya Kalpas (Swarasa, Kalka, Kwatha, Hima, Phanta*) & Secondary Preparations are *Vati, Avaleha, Taila, Ghrita* etc. Though several types of *Kalpanas* are being used presently, *Vati Kalpana* plays an important role in pharmaceutics of *Ayurveda. Vati Kalpana* is a pharmaceutical procedure in which the powder of raw drugs are triturated together with certain *Kashaya* or Juice or even honey and the medicines are prepared in the form of pills or tablets. In *Brihatrayi* different *Vati* formulations are mentioned in different context. But *Acharya Sarngadhara* was the first person who mentioned the detailed description regarding *Vati kalpana* in a separate chapter in *Sharangadhar Samhita.*[2] *Vati* is a solid dosage form that is Prepared by adding the fine powder of drug / drugs to liquefied jaggery or sugar or *Guggulu* or water or honey or *Swarasa* either by Heating or without Heating.[3] Medicines prepared in the form of tablet or pills are known as *Vati* and *Gutika*. These are made of one or more drugs of plant, animal or mineral origin.[4] According to *Acharya Vagbhatta, Vati* is a variety of *Kalka-(Kalkatabheda).*The size of *Vati* depends upon the character of its ingredients. The Synonyms of *Vati* are *Gutika, Vatika, Vati, Vataka, Modaka, Pindi, Guda, Varti.*[5] Although, these preparations differ in size, shape & binding agents, their method of preparation is same.

Vataka: *Vataka* is more bigger than *Vati* in size. Each *Vataka* weighs more than ½ gm.

***Modaka*:** It is rounded bolus (*Laddu*) and may weigh between 20 Gms. – 100 Gms. *Charak* has explained *Shyamatrivritamodaka, Madananandmodaka* etc.[6] Here, he has advised the use of 2 parts of jaggery to prepare the *Modaka.*

***Gutika / Vatika* :** It is smaller in size.

***Pinda* or *Pindi* :** *Harenu* or pea sized pills.

***Guda* :** The medicament in paste / bolus form.

***Varti* :** It is elongated in shape with tapering ends. Generally used as suppository.

Type of *Vati* : In the *Ayurveda* Pharmaceutical descriptions two types of *Vati* preparation methods are mentioned, these are, like (i) *Agnisadhya Vati* and (ii) *Anagnisadhya Vati.*

Agnisadhya Vati: In case of *Agni Sadhya Vati* preparation, the sugar or Jaggery (*Guda*) or *Guggulu* is made like *Lehya* on mild fire then the powders of the ingredients are added to the *Paka (Lehya*) which become soft mass paste like then *Vati* is to be made by rolled into circular in shape.

Anagnisadhya Vati: By this process *Vati* is prepared without heat. The powders of ingredients are either pounded with *Guggulu* and *Guda,* adding with any suggested liquid or honey to prepare the *Vati* or triturated with any suggested liquid or honey to make *Vati*.[7]

General Method of Preparation

The drugs used to prepare *Vati* may be of plant origin, mineral origin or animal origin.The drugs of plant origin are dried & made into fine powder separately. The minerals are made into *Bhasma* or *Shindoor,* unless otherwise mentioned. If *Parada & Gandhaka* are mentioned in any formula, first *Kajjali* is made. In *Kajjali* powder of other ingredients are to be added one after one. These are kept into *Khalwa yantra* and ground to a soft paste with described fluids. When more than one fluid is mentioned for grinding, they have to be used in succession when the mass is properly ground and is in a condition to be made into pills.[8] *Sugandha Dravyas,* like *Kashturi, Karpura* are added & ground again. Before rolling the pills one should ensure that the prepared paste is not sticking to the fingers when rolled. If sugar or jaggery is mentioned then its *Paka* (syrup) should be prepared on mild heat, powders of the ingredients are added, mixed well and pills are rolled when the syrup is still warm. After complete drying, they are stored in air tight containers. If sugar, salt or *Kshara* is an ingredient, the pills should be kept away from moisture.[9]

***Prakshepaka Dravya* & their Quantity[10]**

***Guda* -** 2 Parts of *Churna.*

***Sarkara* -** Four Parts of *Churna.*

***Madhu & Guggulu* -** Equal quantity of *Churna*.

Drava* –Sama Pramana* (*Swarasa*, Decoction).

- 2 Parts for *Modaka.*

Dose: 1 K*arsha* (12 grams) or as per *Rogi & Rogabala.*[11]

Shelf Life / Expiry Period: Pills made of Plant Drugs, when kept in an air tight container, can be used up to two years. *Sharangadhar* has mentioned the expiry period of *Vati* as 1 year.[12] *Vati* containg minerals can be used for an indefinite Period.[13] *Vati* should not lose their original colour, smell, taste & form.

Advantages of Vati Kalpana: *Vati Kalpana* is easy to swallow; odd smell or taste will not be felt. It can be preserved for a longer period than *Churnas.* Volatile principles can be retained for longer duration. Dose can be fixed and advised to patients easily.

Common *Ayurveda Vatis* in Practice: *Agnitundi Vati, Lavangadi Vati, Lasunadi Vati, Chitrakadi Gutika, Dugdha Vati, Dhanvantara Gutika, Prabhakara Vati, Pranada Gutika, Pliharivatika, Bilvadigutika, Marma Gutika, Marichadi Vati, Manasamitravataka, Mrtasanjivani Gutika, Yakrtsulavinasinivatika, Rajahpravartinivati, Sivagutika (Laghu), Sukramatrka Vati, Sulaharana Yoga, Sulavajrinivatika, Sankhavati, Saubhagya Vati, Suranavataka, Astaksarigutika, Eladi Gutika, Kasturyadi Gutika, Kankayana Gutika, Khadiradigutika (Mukharoga), Khadiradi Gutika(Kasa), Gandhaka Vati, Gorocanadi Vati, Candraprabha Vati, Sanjivani Vati , Amrta Guggulu, Abhayadi Guggulu, Abhaguggulu, Ekavimshatiko Guggulu, Kancanaraguggulu, Kaisora Guggulu, Goksyradiguggulu, Trayodasanga Guggulu, Navakaguggulu, Navakarsika Guggulu, Triphalaguggulu, Pancatiktaghrta Guggulu, Punarnavadi Guggulu, Yogaraja Guggulu, Mahayogaraja Guggulu, Rasabhra Guggulu, Rasna Guggulu, Laksa Guggulu, Varadiguggulu, Vyosadi Guggulu, Siba Guggulu, Saptanga Guggulu, Swayambhuva Guggulu, Saptavimsatika Guggulu, Simhanada Guggulu, Vatari Guggulu.*[14]

Tablets in Pharmaceutics[15]**:** Solid dosage forms are the most popular category of pharmaceutical formulations. They are in a sense convenient dosage forms and in comparison to the liquid formulations, their stability is of a higher order. Within the solid dosage forms, unitary forms such as tablets, capsules, pills, cachets, wrapped powders rank high since they ensure accuracy in dosage.[16] Tablets are solid dosage forms of a drug / drugs with or without diluents and prepared either by moulding or by compression. They vary in size, shape and weight. Types of tablets are compressed – through machines and moulded – with the help of molds.

Compressed Tablets

1. Oral tablets – swallowed.
2. Chewable tablets – chewed. Mannitol,Sorbitol, lactose, chocolate powder, dextrose etc. are base of chewable tablets.
3. Sublingual tablets – these are the drugs which are destroyed, inactivated or not absorbed in the GIT but are directly absorbed through the mucosal tissues of the oral cavity.
4. Lozenge tablets – these drugs will not disintegrate in the oral cavity. They will slowly dissolve in the oral cavity to produce continuous effect on the mucous membrane or the throat.

5. Soluble tablets: dissolve in liquids like water. These are used for mouth wash, gargling, skin lotions, douches, antibiotics etc.
6. Effervescent tablets: contain bicarbonate, citric acid and tartaric acid, in addition to other drugs. They liberate $CO^2$and produce effervescence.
7. Vaginal tablets: to insert inside the vaginal cavity.
8. Implants: must be sterile as they are inserted below the skin or in between muscular layers. Usually this type of tablets are used for animals.
9. Enteric coated tablets: these disintegrate in the alkaline media of intestines.
10. Sustained action tablets: After oral administration, these tablets release the drug at a desired time and prolong the effect or the medicament.
11. Sugar coated tablets: Sugar coating is done to mask the odd taste, and odour as well as to protect the substances from atmospheric conditions.
12. Film coated tablets: Thin coating with water soluble materials to protect the drug from atmospheric conditions.
13. Layered tablets: Tablets will have two more layers.
14. Press coated tablets: The granules of incomplete ingredients are compressed around the previously compressed tablets.

Moulded tablets

1. Hypodermic tablets – used for injection. They are clean and sterile.
2. Dispensing tablets.

Stages in the preparation of tablets

I. Powdering of all the ingredients.
II. Granulation with some binding agent.
III. Compression.
IV. Sugar / Silver coating.
V. Colouring.
VI. Polishing
VII. Printing of emblems or name of the tablets.

Evaluation / Standardisation of tablets

I. Diameter, Size and Shape: Confirmed by measuring.
II. Uniformity of weight: Assessed by weighing.
III. Thickness: Assessed with the help of Vernier caliper.

IV. Hardness: if the hardness is more then disintegration time becomes more. If it is too soft, then it will not withstand the handling during packing and transportation. If it is dropped lightly on the floor, it should not break.

V. Friability (Ability to crumble): this test is performed to evaluate the ability of the tablets to withstand abrasion in packing, handling and transporting. The instrument used for this test is called a "Friabilator". It consists of a plastic chamber which is divided into two parts and revolves at a speed of 25 rpm. A certain number of weighed tablets are placed in the rotatory chamber. These tablets are made to fall from a height of 6''to the ground to undergo shock. After 100 revolution the tablets are weighed once again. The acceptable limits of weigh loss should not be more than 0.8%.

VI. Percentage (%)of medicament : it is done to ensure the quantity of medicament within the prescribed limits. From each batch of preparation random samples of tablets are taken. An assay will be done as per prescribed methods. The results must be within the prescribed percentage limits.

VII. Rate of disintegration: Generally the disintegration time for uncoated tablets is 30 minutes and for coated tablets one hour.

RESULT AND DISCUSSION

In *Ayurveda* therapeutics, drugs in both forms are used, crude as well as processed and converted into different formulations. It is necessary that the form of the drugs or formulations when ready for ingestion, should be not only effective but also easy to administer and agreeable to patient. The main emphasis is on removing the physical and chemical impurities from the crude drugs. The form which ultimately comes into use by the patient is termed as a drug delivery system or drug dosage form. Safety, efficacy, stability and palatability are the four basic requirements of a good drug dosage form. *Ayurveda* gives prime importance to these four basic requirements. The different aspects related to drug formulation, preparation, storage etc., are dealt in a sub-division known as *Bhaishajya Kalpana*.[17] Different *Kalpanas* are mentioned in *Vedas &Samhitas*. Probably one of the first instances of the therapeutic use of *Kalka* of herbal drugs is mentioned for external application in some traumatic condition. *Vati Kalpana* is the *bheda* of this *Kalka.*

CONCLUSION

Vati Kalpana is the concept which is highly accepted by *Ayurveda* in ancient and modern era because of its easy way of preparation and having the potency received after *Mardana* and

Bhavana. In general practice, the highly accepted common dosages form is *Vati* as it is available due to enumerable production and palatable nature.

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