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Probable Modifications of *Kwathakalpana*

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ABSTRACT

In Ayurveda there are number of effective basic formulations (*Panchavidha Kashaya Kalpana*) for treating various diseases but among them *Kwath Kalpana* is the most common and widely used dosage form in *Ayurvedic* pharmaceuticals. It is also basis of preparative method of other secondary dosage form such as *Avaleha* (linctus), *Sneha kalpana* (medicated oil and ghrita), *Sandhana kalpana* (Alcoholic preparation). However, due to inconvenience of preparation and time taken, *Kwath* preparation is losing its utility and less shelf life & unpalatability pose as major challenge. In the present scenario due to globalization there is a need of its different dosages form which is effective without compromising the therapeutic efficacy of drug. Modified & improved dosages form of *kwath kalpana* are Granules, *Rasakriya*, *Ghana*, Powder/ Tablets, Syrup, *Pravahi Kwath* etc. Hence this paper discusses proper approach and need to review Probable pharmaceutical modifications of *Kwath* at present scenario with their Merits and Demerits to optimize the major challenges faced by physician and patient.

KEYWORDS

Dosage form, Kwath Kalpana, Unpalatability, Pravahi Kwath



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INTRODUCTION

Pancha Vidha Kashaya Kalpana are the primary preparations and the most widely used as a starting dosage form and base for much different dosage form. All *Kalpanas* are aimed at isolation of suitable active principle but *Saviryata Avadhi* (Shelf life) of *Ayurvedic* preparation is a main problem specifically with *Panchvidha Kashaya kalpana* with their difficult handling, poor palatability and odour etc.

The word *Kwath* is derived from the word '*Kwatha Nispade*' which means boiling¹. A detailed description of *Kwath* is available in all *Samhita*. In Modern Pharmaceutical Science *Kwath* is known as Decoction. *Kwath* has got versatile role among the various medicinal preparation because it is also basic material for preparation of other secondary dosage form such as *Avaleha* (linctus), *Snehapaka* (medicated oil and ghrita), *Sandhana kalpana* (Alcoholic preparation).

Merits of *Kwath Kalpana*²

- It can be prepared in very short duration.
- It is suitable, easiest process for achieving water soluble extractives into a liquid dosage form.

Demerits of *Kwath Kalpana*

- It must be used freshly because of its less shelf-life. It should be consumed at the time of preparation.

- It is diluted form of Active principles in water hence its higher dose requires to gain the desired therapeutic effect.

- *Kwath* can-not be prepared from the medicaments containing maximum volatiles active principles.

- Being a liquid dosage form it is not easy for packing, transporting and dispensing the decoction.

Kashaya's are prepared in water which decreases the stability of the product. Water may be inert medicinally and undesirable because it easily ferment or decompose and favourable for the growth microorganisms which brings about decomposition of the product. The sugars and carbohydrates in the product result in alcoholic fermentation while protein leads to nitrogenous fermentation.

Water promotes many enzymatic reactions such as hydrolysis. Exposure to air and light accelerate spontaneous oxidation which results in unpleasant odour and taste and it becomes rancid. Humidity contributes to early decomposition contamination, mould growth, fungal growth. Alcohol and fat soluble constituents cannot be extracted by these methods³.

Modification of *kwath kalpana* in *Ayurvedic Text*^{4,5,6}

Ushnodaka-The water obtained by boiling and reducing to one eighth or one forth or



sufficiently boiled. One fourth part, half part and three fourth part of water is allowed to reduce by boiling which respectively act as *Vatahara*, *Pittasamaka*, *Kaphahara*.

Tandulodaka- The ratio of water: broken rice is 8:1 as told in Sharangdhara Samhita.

Laksharasa- *Laksarasa* is water extract, obtained by boiling laksha/gum of *Ficus religiosa* in *dolayantra* with 6 part of water boiled till water is reduced to one fourth. Then it is decanted and filtered through a clean cloth 21 times. It is useful for muscular dystrophy.

Pramathya-It is a thick decoction, obtained by boiling one part of paste of herbs in 8 times quantity of water on low flame and reducing to half or one fourth then macerated (consumed unfiltered) in the dose of 2 *pala*(96 grams).Chakrapanicommenting on *pramathya*, it is a *Pachana Deepana Kasaya* but is thicker in consistency than the usual *kashaya*. In Astang Sangarha the term *Pramathya* is used for *Kashaya*.

Mamsa ras- bones are separated from Goat meat and its marrow come into water when boiled at low flame and it remains in semisolid form.

Rasakriya-It is obtained by reheating the decoction, until it turns in solid consistency. Take one part of drug to eighth or sixteenth parts of water has to be added and boiled on mild fire until one eighth part remains, then

filtered and it is further boiled until it turns solid form.

Ghanasatva- *Satva* is water extracted of starch dominated herbal raw material. *Ghana* is prepared by condensing the strained *kwath* then that concentrated decoction is poured into large trays and subjected to complete evaporation of water content in direct sunlight.

Gudapaka- In filtered decoction specified quantity of *Guda* should be added and thick syrup of 3-4 threads consistency is prepared.

Sarkara-To prepare syrup,2 parts of sugar is mixed in to 1 part of *kwath / swarasa*.

Ksheerpaka⁷-This is a unique preparation initially described by Astanga Samgraha later described in Sharangdhar Samhita and Dravyaguna Vigyan. In some drugs which have *teekshan* property and unfavourable palatability due to unpleasant odour, taste etc. are allowed to processed with milk form asking the bad palatability and reducing the sharp effect.

It is the liquid dosage form which is prepared by decoction process where drug, milk and water are taken in the ratio of 1:8:32 respectively and boiled to mild fire till the milk remains.

According to Yadavji Drug: Milk:Water ratio is 1:15:15⁸and according to Govind Das Sen Drug: Milk: Water ratio is 1:8:8⁹

Recent Modifications in *Kwath Kalpana*



Kashaya are actually decoctions, the water soluble extracts are obtained through boiling water with various herbs. Presently there are various *kwath* preparations which are either based on sugar or alcohol preservatives. Few modifications which are used now a day are as given below

Granules¹⁰

Keeping the formulations mentioned in Ayurvedic texts unchanged and by applying modern manufacturing technology *kwath* can be used readily in the form of soluble granules. They have rich original taste of fresh *kwath*. It does not contain any sugar alcohol & any harmful preservative.

***Kwath* preparation for granules¹¹**

Coarse drugs are mixed with 16 times water and kept aside overnight for soaking (12 hours). Next morning it was subjected to mild heating with continuous stirring. Reduction was done until the quantity was reduced to *pada-shesha* i.e. one-fourth of the initial quantity. After desired characters and volume achieved, the *kwath* is filtered through four fold clean cloth and collected.

Granules formation¹²

Freshly prepared decoction subjected to mild heat and reduction is done up to semisolid stage with continuous stirring and there is no covering on the mouth of vessel. When the vessel is taken out from the heat source fine drug powder is added and homogeneous mixing is done by continuous

stirring to obtain uniform mass which is passed from sieve (#20) to obtain granules. Prepared granules are dried at room temperature then dried in oven at 60°C and pack in air tight container. Granular preparation is safe, effective and simpler to control, produce and manage as a consistent medical product than decoctions.

Following are the advantages of pharmaceutical granulation

- An improvement in powder flow
- An increase in bulk density
- A more uniform particle size
- An improvement in operator safety

***Shakar* (syrup)^{13,14,15}**

It is aqueous preparation of a sugar or sugar substitute and medicinal substances. It is aqueous concentrated solution of sucrose mixed with decoction of medicaments and other additives. In addition of purified water and medicinal agent, other additives like sucrose, solubilizing agents or sugar substitutes, colorants, thickeners and stabilizers may be added. In some cases dextrose, glycerin, sorbitol or other polyhydric alcohols are added in syrup to reduce crystallization of sucrose or to increase solubility of medicaments and other additives etc.

Syrup also functions as

- Sweetening agent
- Good antioxidant



- Demulcents and soothing agent
- Vehicle

Preparation of *Sharkar*

Drug is cut into small pieces and kept in water overnight. Next day content is heated on *Mandagni* (30-40⁰C) and reduced to one fourth quantity. Then the decoction is cooled and filtered. This filtrate is taken for the preparation of herbal syrup then 66.7% sugaris added in this filtrate and mixture is boiled for 5-10 minutes. It has longer shelf life and easy administration in children as sugar is the main content.

Merits of syrup

- Most of the syrups have pleasant taste.
- They contain little or no alcohol.
- Syrups which have specific gravity, 1.313 are self-preservative.
- Any water soluble extract of drug can be given in the form of drug.
- Drugs being in dissolved form have high rate of absorption.

Demerits of syrup

- They may cause an increase in dental carries and gingivitis.
- They are not preferred to those patients who are on a restricted caloric intake.
- Any breakage spoils the whole unit containers.
- Syrup cannot be administered in place of *Kashaya* (except diabetes).

Powder/Tablets^{10,13}

The solid dosage forms supplied either in bulk or individual dose in the fine state of drug. They are classified into external and internal on the basis of use. The liquid evaporates to form a semisolid paste, then it is poured into a spray drier along with a powder carrier and the remaining water is evaporated until leaving a dry powder. The addition of carrier is very important because dried substance will turn into a gummy solid or hard mass when exposed to even a small amount of moisture. Starch or other material present in it prevents this. On the basis of use powders are classified into internal and external. Internal are classified into Divided and Bulk. Divided classified into Simple and Compound enclosed within tablet and Bulk into Eff. Powder Snuff, Antacids, Laxative etc. External are divided into Medical Dusting powder, surgical dusting powder, Dentifrices, Insufflation.

Merits of powder

- Unit dosage form, distaste of *kashaya* can be avoided.
- Most versatile, easy to administer.
- Precisely prescribed by physician.
- Most stable dosage form as compared to liquid dosage form.
- Rapidly absorbed due to their rapid rate of dissolution.
- Easy to carry than liquids, longer shelf life, Children compatibility.



Demerits of the powder

- Drugs, sensitive to atmospheric conditions like air, moisture and light are not suitable.
- Drugs which are bitter, unpalatable, corrosive are not suitable for powder form.
- Drugs which are volatile in nature are not used in powder form.
- Powder is a time consuming process since it involves number of operations like milling, sieving, mixing, drying etc.

Ghana Kalpana^{15,16,17}

It is secondary preparation of *Kwath Kalpana*. As defined in Sharangdhara Samhita, decoction is prepared by heating continuously on mild fire till the water portion evaporates and it becomes thicker in consistency (Viscous-semisolid-solid) by further process of heat. The semisolid material is called *Ghana* or *Rasakriya*. When this material is given to the form of vati and dried in shade it is known as *Ghana vati*. *Ghana* is prepared from that drug which contains starch, carbohydrate along with sweetening material e.g Yastimadhu whereas *Rasakriya* is prepared from which that contains starch and carbohydrate only e.g Daruharidra

Merits of *Ghana Kalpana*

- Higher concentration
- Lower dosage
- Subtle in nature

- Longer shelf-life
- Better bio availability

All the concept of modifications of *kwath* are based on the principle of extractions i.e water soluble principle of extractions. So we would like to propose that administration of water soluble extracts in form of *Ghana* is more preferable than any other form¹⁸.

Pravahi kwatha^{19,20,21}

Kada / pravahi kwath is the fermented form of *kashaya* meant to increase shelf-life. Formulation in concentrated and fermented form is a new modified dosage form prepared by concentrating one of the basic formulation of *Panch vidha kasaya kalpana* i.e *Kwath*. It is the secondary formulation of decoction which is prepared by adding sweetening i.e Jaggery and fermenting agent i.e Dhataki flower (*Woodfordia fruticosa*) in freshly prepared *Kwath*.

Ayurveda *SaraSamgraha* mentions about “*Pravahi Kwatha*” but no direct references are observed in classical text. Due to its increased palatability & stability most of the pharmacies have started marketing these types of dosage form in place of decoction.

We can compare *Pravahi kwath* in modern dosage form as Elixirs. Elixirs are clear, sweetened, hydro-alcoholic, flavoured liquid. Primary solvents for elixirs are water



and alcohol. It is prepared by simple solution with agitation and/or by the admixture of two or more liquid ingredient. Water soluble and Alcohol soluble components are dissolved separately in purified water and alcohol respectively. Then the aqueous solution is mixed with the alcoholic solution.

Merits of *Pravahi Kwath*

It is able to maintain both water soluble and alcohol soluble drugs due to its hydro-alcoholic nature. More stable, no need of adding preservative, simple dissolution method is adopted for manufacturing.

Demerits of *Pravahi Kwath*

Not much liked by children due to its alcoholic taste.

DISCUSSION

Kwath kalpana (decoction preparation) is mentioned among five *basic Kalpanas* in *Charak Samhita*, the prime text of Ayurveda. Presently there are various preparations available in the form of liquid which is either based on sugar, alcohol or preservatives etc. Liquid dosage forms are difficult to handle and have a strong chance of breakage, leakage and spoilage of container. Additionally, in fast moving life style, the lack of time for *kwath* preparation has been losing its utility. Owing to certain drawbacks in fresh *kwath* preparation there

is a need to develop more stable and convenient secondary preparations. In modern science few chemical preservatives like benzoic acid, sodium benzoate are used in pharmacies for preservation of various *kashaya*'s. But the result is a substantial reduction of original medicinal and nutritive value of drugs. Administration of the drug in various dosage forms provides a prospect to the physician to prefer better options. There is an attempt to develop an easy to use and stable dosage form with more shelf life i.e granules, Syrup, Powder/tablets, *Ghana kalpana*, *Pravahi kwath* etc.

CONCLUSION

Now a day globalization can be seen in each and everything in the world. So to globalize modification is essential. Modifications also help in improving palatability and we can increase the shelf-life of medicines. Moreover transportation becomes easier with modified dosage form. *Acharyas* have added new innovative dosage form through their own ideas & with the help of other systems, in the same way we can make new dosages form with the help of modern technology or by our own ideas. With modification active components can be stored for many years. This will give proper



shape and dose of Administration of medicaments.

Conflicts of interest

There are no conflicts of interest.



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