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Standardization Of Sushrutokta method of preparation of Vibhitaki Pratisaraneeya Kshara

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Abstract

BACKROUND: The Ayurvedic surgeons across the country commonly use *apamarga kshara* for *ksharakarma.* Specific standardization protocols have been developed to standardize the kshara but very few attempts have been made to standardize the kshara prepared by the method of Sushruta Samhita. *Apamarga* is rarely found in heart of the urban districts and hence alternate sources are of need. *vibhitaki* is one such alternate which is abundantly found in urban districts, mentioned among the *kshara dravyas* which is used in this study. MATERIALS AND METHODS: the kshara was prepared in accordance with the method mentioned in *Sushruta Samhita* and a sample was sent to the State Drug Testing Laboratory, Anna Nagar, Chennai and analysis was done for basic physicochemical properties, metallic analysis and bsic microbial assay OBSERVATION AND RESULTS: the analysis revealed that the sample had a pH of 10.56, loss on drying 53.67%, total ash 31.96%, water soluble and alcohol soluble extracts 30.31% and 26.10% respectively and the presence of calcium and sodium with a few bacterial and fungal growths well within the allowed limit and absence of harmful bacteria of E.coli, salmonella, pseudomonas and staphylococcus did not grow even in culture. CONCLUSION: the *vibhitaki pratisaraneeya kshara* can be a good alternate kshara as the results show that it has sufficient potency required for performing *kshara karma.*

Keywords: *Vibhitaki pratisaraneeya kshara,* Standardizarion, hemorrhoids

Introduction

The cases of haemorrhoids are in the rise especially in the urban population due to their change in dietary habits and lifestyle. The people with their fast mind-set need a quick and complete recovery with no or minimal complications. The present available treatments including laser treatment for haemorrhoids though are indeed quick and effective but are not pocket friendly to the patient. In Ayurveda, a great alternate treatment modality is kshara karma. It has got high success rate, highly affordable and has minimal complication rate. *Apamarga pratisaraneeya kshara* is widely in use throughout the country. However, there is an increasing demand of an

alternative especially in urban cities like Chennai where the availability of such a huge quantity of the plant has become difficult as it has become scarce. *Vibhitaki* is one such alternate which is not only widely available but also from a single tree a large quantity of raw materials can be obtained. But to establish scientifically that it can indeed be an ideal substitute for *apamarga*, Standardization of *vibhitaki pratisaraneeya kshara* becomes the epoch-making step to establish it.

Method of preparation of kshara

- Preparation of ash
  The leaves, stalk, bark and fruits of *vibhitaki* was collected and dried under sunlight for 2 weeks. After they are completely dry, they were burnt along with *sudha* in a *hundi.* The ashes were collected once it was cooled down and weighed.
- Preparation of *kshara jala*
  One part of ash was added with 6 parts of water, mashed thoroughly with hands and kept undisturbed overnight. The clear supernatant is collected separately and is filtered through a thick cloth for 21 times. The final product after the last filtration is known as *kshara jala.*
- Preparation of *kshara*
  The *Kshara jala* was heated in mild flame until boil and divided into two parts. In the first part pieces of *shanka* and *shukti* were heated red hot and immersed in the *kshara jala* 21 times each. In a dry iron vessel, the same pieces of shanka, shukti were pounded till it became a fine powder. Immediately after this, all the *kshara jala* that was separated earlier was added to the iron pan and boiled till water level has halved from the initial level. Then paste of *chitraka, vacha, langali, hingu* were added in small quantity to make this into *teekshna kshara.* Heating was continued till the compound was reduced to a semisolid consistency. The mixture was allowed to cool on its own and then it was transferred to an airtight glass bottle.

Standardization methods

The sample of the prepared *kshara* was sent to Government Drug Testing laboratory, Anna Nagar, Chennai and the following tests were conducted

- Basic physicochemical characteristics
- Metallic analysis including heavy metal toxicity
- Basic microbial assessment

Observations and results

It was observed that there was around 33.3% loss in the weight after drying. The parts burned well with the fruits and seeds taking more time to burn. The ash along with the burnt *sudha* was 22.3 percent of the sample weight after drying. To this 6 times of water was added and the mixture tasted salty, pungent and had a specific odour. Upon macerating and soaking it overnight and then carrying out the filtration through a thick cloth, around 68% *ksharajala* was obtained, a clear liquid having the colour of cow's urine. pH of this liquid was between 9 to 10 when tested with a pH paper. The heating of the *ksharajala* gave rise to a pungent order slightly irritant to the eyes and nose. The procedure of heating conch and oyster shells 21 times each increased the solubility of calcium as evident by the change in the size of the shell. Furthermore, the dipped shells became softer and were able to be pounded much easily to nearly fine powder in a mortar and pestle which otherwise, is a near to impossible task. This powder upon heating it in an iron vessel became very fine over time and hence can further increase the solubility in the last step of preparing *kshara.* The addition of the paste of four ingredients is done to increase its potency. The total *kshara* obtained in the end was around 11.3% of the total quantity of ash obtained.

The results of Physicochemical characteristics, elemental analysis and microbial assessment are given in the table;

Parameter	Results of analysis	Specification

Description	Brown colour semi-solid	-
Loss on drying at 105°C	53.67%	
Total ash	31.96%	
pH(1% solution)	10.56	
Water soluble extractive	30.31%	
Alcohol soluble extractive	26.10%	
Test for Potassium	-	-
Estimation of Calcium	The sample is found to contain 2.18% of calcium	
Estimation of Sodium	The sample is found to contain 4.17% of sodium	
Total bacterial content	4×10^4 cfu/gm	Allowed limit – 10^7 cfu/gm
Total fungal count	3×10^2 cfu/gm	Allowed limit – 10^3 cfu/gm
Estimation of *E.coli*	Absent	Absent
Estimation of *salmonella sp/g*	Absent	Absent
Staphylococcus aureus /g	Absent	Absent
Pseudomonas aeruginosa /g	Absent	Absent

The rationality of each step of preparing *kshara* and the results obtained in the standardization report will be discussed hereon.

Discussion

- **On preparation of drug**

In this study, preparation of *kshara* was done as per the reference in *Sushruta Samhita.* The main dravya *vibhitaki* is mentioned under *kshara dravyas* by *Sushrutacharya.* However, there is no direct indication of the drug in *arsha. Charakacharya* mentions that *doshas* in *rasa, rakta, mamsa and medo dhatus* can be treated with *vibhitaki. Arsha* involves all the dhatus except *meda* and this gives a positive reason for its selection. The stalks and barks of the tree were cut into pieces for better drying. The fruits were initially dried and later slightly crushed to facilitate drying of the seed as it takes more time to burn. There was complete combustion of all the components. The thick cloth was used to prevent large sediments to enter the filtrate and repeating it 21 times ensures we get a clear fluid at the end of the process. There is a proven theory that the alkalinity of the *kshara* is directly proportional to the quantity of hydroxide content and not the carbonate content. Both the *nirvapa dravyas* are chemically calcium carbonate [$CaCO_3$]. This is converted to Calcium Hydroxide by the process of nirvapa as supported by the principles of chemistry. When dry heated to red hot, it is converted to Calcium Oxide [CaO] with the expulsion of Carbon dioxide [CO_2]. This when dipped in the *ksharajala,* it comes in contact with water [H_2O] forms Calcium Hydroxide [$Ca(OH)_2$] by the principles of organic chemistry. Addition of the paste of drugs of *chitraka, vacha, hingu and langali* were done as the drugs possess *arshonashana* as well as *vedanāsthāpana* properties. The plants' extracts have also shown to have antiinflammatory, antioxidant, antimicrobial activities thus possibly playing a crucial role in controlling postoperative inflammation and pain as well as in preventing complications due to infections.

- **On standardization report**

As it was prepared in a semisolid paste like consistency there is more loss on drying of 53.67% when compared to the standard. Higher concentrations of dissolved sodium and calcium increased the total ash value justifying the 31.96% in the report. Presence of alcohol and water soluble extracts possibly were the extracts possessing the properties mentioned earlier which can aid in earlier recovery of the patient postoperatively with almost nil complications.

Metallic analysis revealed no heavy metal toxicity but had significant calcium and sodium contents. This justified the alkaline pH as strong metals make the compound more alkaline.

The moisture content of the kshara was the reason behind performing the microbial assessment to check for growth of major groups of bacteria and fungal groups which could cause unwanted complications. The result showed that both bacterial and fungal growths are well within the limits. A few common bacteria were all absent even on culture. Furthermore, this growth can be reduced by leaving a layer of *kshara jala* above the paste.

Conclusion

The *kshara* prepared from *vibhitaki* can be used as an alternate *kshara* in regions where *apamarga* is scarce or not available in large quantities though it's efficacy may not be the same.

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