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Pharmaceutical - Nutraceutical Aspect of *Chanaka Yoga*: A Herbal Formulation for DM II

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Abstract

Introduction: In the last few decades, there has been exponential growth in the field of herbal remedies. Pharmacopoeial preparations such as *avleha* (semisolid), *swarasa* (expressed juice), *kalka* (mass), him (cold infusion) and *phanta* (hot infusion), *kwatha* (decoction), and *churna* (powder) form the backbone of Ayurvedic formulations. Newer guidelines for standardization, manufacture, and quality control, and scientifically rigorous research will be necessary for traditional treatments. This traditional knowledge can serve as a powerful search engine that will greatly facilitate drug discovery. **Aim:** The aim of this study is to standardize *Chanaka Yoga* in *Kwath churna* form. The powder form makes this traditional drug more stable for long-term storage and hence, easier to preserve. **Materials and Methods:** *Chanaka Yoga Kwath churna* is an Ayurvedic formulation containing *Chanaka* (*Cicer aritinum*) as one of its chief ingredients. The basic preparation of this drug is a *Kwath churna*. We checked the microbial load and nutrient values (using International Standard IS and Association of Official Analytical Chemists methods). **Results:** The powdered form of *Chanaka Yoga Kwath churna* yielded a weight loss of approximately 2.5% of the total weight of ingredients. The quantity of total fiber of *Churna* was found higher. **Conclusion:** *Chanaka Yoga Kwath churna* may be a good therapeutic and dietary medicine for Diabetic patients, which may be easily prepared at home.

Key words: Ayurveda, *Churna* (powder), *Chanaka Yoga*, *Kwath churna*

INTRODUCTION

Ayurveda, the herbal-based system of medicine is now well recognized not only in India but also in the Western world. With the growing need for safer drugs, attention has been drawn to the quality, efficacy, and standards of Ayurvedic formulations.[1] Approximately, 347 million people are diabetic worldwide, among which 90% are suffering with type 2 diabetes mellitus.[2] In 2011, India had 62.4 million people with type 2 diabetes, compared with 50.8 million the previous year, according to the International Diabetes Federation and the Madras Diabetes Research Foundation.[3] It has also been reported by the WHO that in 2014, the global population suffering from diabetes is 9% among adults aged 18 and more years.[4] The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs especially the eyes, nerves, kidneys, heart, and blood vessels (guideline for type 2 diabetes mellitus ICMR publication). Ayurveda is being used since a long time ago for curing of many of the diseases and as well as it has treated people suffering from *Madhumeha*. It has been declared that by the prescribed consumption of *Rasausadhies Madhumeha* can be treated effectively.[5] *Chanaka* consists of flavonoids such as quercetin, isoquercetin, kaempferol-3-glucoside, astragalin, populnin, biochenin-A-7-glucoside, isorhamnetin, protensein, garbanzol, and cyanogenic glycosides. It has been used therapeutically for the treatment of annadravasula (gastric ulcer), chardi (emesis), daha (burning sensation), jvara (fever), kasa (cough), pinasa (chronic rhinitis/sinusitis), prameha (metabolic disorder), sosa (emaciation), svasa (asthma), trisna (thirst), and udara (diseases of abdomen). Haridra, i.e., popularly known as haldi or turmeric has been reported to have numerous medicinal properties as it has constituents such as essential oil and a coloring matter (curcumin). Therapeutic

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uses of haldi include visavikara (morbidity due to poisonous substance), kustha (leprosy), vrana (wound), prameha (urinary disorders), pandu (anemia), sitapitta (urticaria), and pinasa (chronic rhinitis). *Daruharidra* mainly consists alkaloids and has therapeutic uses such as kandu (eaching), medoroga (obesity), mukharoga (mouth disease), varna (wound), amatisara (diarrhea), kaphroga (cough disorder), karnaroga (ear disease), netraroga (eye disease), and meha (diabetes). *Haritaki* has been used to treat vibhandha (constipation), aruchi (anorexia), udavrata, gulma (abdominal tumor), udararoga (abdominal disorder), arsa (hemorrhoids), sotha (inflammation), jirnajvara (chronic fever), prameha (diabetes), siroroga (headache), kasa (cough), tamaka (asthma), and hridroga (cardiac desease). *Bibhitaki* contains gallic acid, tannic acid, and glycosides as its major constituents. It has been used to treat svarabheda (hoarseness of voice), netraroga (eye disease), kasa (cough), chardi (vomiting), and krimiroga (worm infection). *Amalaki* commonly known as amla mainly consists of ascorbic acid and gallotannins. It also possesses great medicinal value and has been used for the treatment of raktapitta (bleeding desorders), amlapitta (hyperacidity), and prameha (diabetes).[6] *Amalaki*, *Haritaki*, *Bibhitaki*, and *Daruharidra* along with other medicinal Ayurvedic plants have been reported to treat *Madhumeha* by Ankush *et al.*[7] They have orally subscribed Triphaladi granules to 51 patients in a dose of 5 g twice a day. Result observed was that Group A showed moderate improvement in 37.5% cases and 50% cases showed improvement of diseased condition. Group B also showed a moderate improvement in 16% of cases and 56% as a mild improvement after the treatment. One finding of an experimental study done[8] by the support the above traditional view that combination of turmeric and Indian gooseberry can provide benefit to diabetic patients. In combination, these two plant products probably potentiate the actions of each other. The hypoglycemic effect of turmeric has been suggested to be due to increase peripheral glucose utilization decreased hepatic glucose synthesis and/or increase in insulin secretion. Therefore, this formulation can be effectively used as medicine as well as consumed regularly as a dietary supplement in case of diabetes mellitus and prediabetic patients.

Ayurveda mentions specific drugs that are given for a definite duration along with specific dietetic regimens for Diabetic patients. *Chanaka Yoga Kwath churna* is an Ayurvedic herbal formulation containing *Chanaka* as the chief ingredient. It alleviates anxiety, obesity and is a natural pain reliever known to contain about 6 crude drugs.[9]

Chanaka Yoga Kwath churna: An overview

Ayurveda uses various formulations such as *churna* dosage forms (powder), liquid dosage forms (*asavas*, *aristhas*), and semisolid dosage forms (*ghrita*, *avleha*, *and paka*). Pharmacopoeial preparations such as *swarasa* (expressed juice); *kalka* (mass), *him* (cold infusion) and *phanta* (hot infusion), *kwatha* (decoction), and *Kwath* (decoction) form the backbone of Ayurvedic formulations.[10]

Chanaka Yoga is a classical preparation from the Ayurvedic text, i.e., "Vaidya Chintamani." It is a very useful drug for diabetic patients. It contains all the medicinal and nutritional value which are required diabetic patients and can be easily prepared at the home. Therefore, this formulation can be effectively used as medicine as well as consumed regularly as a dietary supplement in case of diabetes mellitus and prediabetic patients. Following this condition, it is improve digestion and relieves debility.

Chanaka Yoga Kwath churna, is appropriate to review is not very well known it, but because of its usefulness this traditional drug. As the *churna* preparation stored for long periods. Thus, the formulation can be manufactured in large scale to be marketed as an Ayurvedic medicine.

Chanaka Yoga consists of 6 ingredients including, which have their individual health promotive effects; and their roles in diabetes mellitus have been discussed in Table 1 and Figures 1-6.

The objective of this study was to develop a more stable *churna* formulation using the same traditional medicinal herbs.

MATERIALS AND METHODS

Estimation of moisture content routine procedure[10]

The moisture content of the raw materials used in preparation of the *Chanaka Yoga* was estimated as follows:

1. Weights of raw material samples and weights of Petri-plates were taken separately
2. The fresh samples were taken in the Petri-plates
3. The Petri-plates were incubated in the oven for 24 h at 105°C
4. The samples were removed from the oven and cooled to room temperature

Table 1: Ingridients of *Chanaka Yoga* with the details of Sanskrit name, botanical name, family, and part used

Substance	Botanical name	Family	Part used
Chanaka	*Cicer arietinum* Linn.	Papilionaceae; *Fabaceae*	Seed
Haridra	*Curcuma longa*	*Zingiberaceae* Linn.	Rhizome
Daruharidra	*Berberis aristata* DC.	*Berberidaceae*	Stem
Haritaki	*Terminalia chebula* Retz.	*Combretaceae*	Fruit pulp
Bibhitaki	*Terminalia bellirica* Roxb.	*Combretaceae*	Fruit pulp
Amalaki	*Emblica officinalis* Gaerth.	*Euphorbiaceae*	Fruit pulp

Figure 1: *Chanaka*

Figure 2: *Haridra*

Figure 3: *Daruharidra*

Figure 4: *Haritaki*

Figure 5: *Bibhitaki*

Figure 6: *Amalaki*

5. Again the weights of the raw material along with the Petri-plates were measured.

Moisture content was calculated using the formula:
(Weight of Petri-plates + Weight of raw material) – Weight of oven − Dried sample weight of oven – Dried sample × 100.

Preparation of *Chanaka Yoga Kwath churna*

All the raw materials required for the preparation were weighed in kilogram [Table 2] and powdered separately in a pulverizer and weighed again. Mixing of all ingredients in equal quantity and then weighted again.

1. *Chanaka Yoga* contains 6 ingredients, i.e. *Haridra, Daruharidra, Haritaki, Bibhitaki, Amalaki, and Chanaka* were procured from Gola Denanath (Raw drug market), Varanasi. After identification by Dr. S.D Dubey, Retired Professor, Department of Dravyaguna, Faculty of Ayurveda, IMS, Banaras Hindu University
2. During the preparation of *Chanaka Yoga Kwath churna*, coarse powdering of each sample was done separately
3. All the contents were properly mixed in equal quantity and then to obtain *Chanaka Yoga Kwath churna.*

Assessment of nutritive value of *Kwath churna* preparations of *Chanaka Yoga*

The samples of the both forms (Kwath *churna* and *Chanaka*) of the drug were analyzed Centre of Food Science and Technology Institute of Agricultural Sciences, BHU, where certain tests performed to investigate their nutritional value. They used the "IS method" and "Association of Official Analytical Chemists Method."

Shelf-life analysis of *Chanaka Yoga Kwath churna*[11]

This test was performed to check the microbial load of both the samples in our own laboratory. The samples were incubated in Yeast Extract Mannitol (YEM) medium for 36 h along with plain YEM medium as a control.

RESULTS

The color of *Kwath churna* was brownish yellow. The total weight loss of the drug during the final preparation was 2.5% [Table 3]. The moisture content of *Bibhitaki* was found to be the highest (13.9) whereas it was the lowest in *Amalaki* (6.49) [Table 4].

The total fiber of *Chanaka Yoga* (12%) was higher than that of *Chanaka Yoga Kwath churna* (5.6%). Carbohydrate content was approximately the same for preparations whereas iron and protein were higher in *Chanaka Yoga* in comparison with *Chanaka Yoga Kwath churna* [Table 5].

In the shelf-life, we found no contamination in either of the samples (*Churna* preparation was 1 year old [Figure 7].

DISCUSSION

Ayurveda is practiced widely in India, Sri Lanka, and other countries, and has a sound philosophical and experiential basis.[12,13] Atharvaveda (around 1200 BC), Charak Samhita, and Sushrut Samhita[14] (1000–500 BC) are the main classics that give a detailed description of over 700 herbs. Today the Government of India has formed stringent to regulate issues related to quality, safety, efficacy, and practice of herbal medicine.[15] With a unique holistic approach, Ayurvedic medicines are usually customized to the individual's constitution.[16]

Table 2: Ingredients of *Chanaka Yoga*

Ingredients	Weight kg
Haridra	25
Daruharidra	25
Haritaki	25
Bibhitaki	25
Amalaki	25
Chanaka	38

Table 3: Weight loss of ingredients during preparation of *Kwath churna*

Name of ingredients	Initial weight	Final weight	Loss of weight
Chanaka Yoga Kwath Churna (kg)	125	122.5	2.5
Haridra (g)	25	24.5	500
Daruharidra (g)	25	24.3	700
Haritaki (g)	25	24.6	400
Bibhitaki (g)	25	24.5	500
Amalaki (g)	25	24.6	400

Table 4: Total loss of moisture content of ingredients

Sample	Moisture content
Chanaka Yoga	9.77
Chanaka	7.49
Haridra	9.92
Daruharidra	6.91
Haritaki	10.3
Bibhitaki	13.9
Amalaki	6.49

Table 5: Estimation of nutritive value of *Chanaka, Chanaka Yoga Kwath churna*, and *Chanaka Yoga:* A comparative analysis

Nutrients	Chanaka (%)	*Chanaka Yoga Kwath churna* (%)	*Chanaka Yoga* (%)
Carbohydrate	13.04	11.3	13.7
Protein	9	1.5	6.9
Fat	2.9	0.1	1.4
Vitamin C	12.03	22.9	17.1
Total fibre	3.1	5.6	12
Iron	24.23	1.2	28.51

Figure 7: Shelf-life study of *Chanaka Yoga Kwath churna* after 36 h incubation

Standardization and development of reliable quality protocols for Ayurvedic formulations using modern techniques of analysis is extremely important.[17] Standardization should be done using appropriate amounts of raw materials, followed by in-process control and shelf-life analysis with authentic clinical trials.[18]

Chanaka is used in folk medicine for relief from many ailments, especially cardiovascular desiese,[19] Cancer,[20,21] and Obecity.[22,23] *Churna* and *Kwath kalpana* both have a similar effect in *Madhumeha*. However, the present study was focused on *churna kalpana* because of the long shelf-life of *Kwath kalpana*. According to the "Bhaishajya kalpana vijnanam," the *Kwath* should be used within 12 h only,[24] whereas *Churna* is safe for use even after 1 years. The nutritive value is also an important reason for the preference of *Churna* to *Kwath*. In light of this information, *Chanaka Yoga Kwath churna* to be used for this study was prepared from the same ingredients as those described in *Vaidya Chintamani*.

CONCLUSION

Chanaka Yoga can be prepared in *churna* (Powder) forms. The *churna* can be seen to be better than the *kwath* form due to its longer shelf-life and comparatively higher nutritive value. *Chanaka Yoga* may be a good therapeutic and dietary medicine for diabetic patients, which may be prepared at home easily. This traditional formulation can provide novel insights into the drug discovery and development process. This drug can be useful for the pharmaceutical companies searching for economically valuable natural products.

The design of a new drug necessitates the study of the effects of a drug. Thus, the clinical benefits of this Ayurvedic drug over standard therapy should be extremely convincing. Hence, there is a need for further study to evaluate the effects of the drug by a case–control study and to elucidate its complete mechanism of action.

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