A REVIEW ON THE PROBABLE MODE OF ACTION OF HINGUVACHADI CHURNA (POWDER) - AN AYURVEDIC FORMULATION WITH MULTIFACETED ACTION

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ABSTRACT

Since time immemorial, a wide variety of various formulations have been used by Ayurvedic physicians to treat different gastrointestinal disorders which includes Churna (powder), Kwatha (decoctions), fermented preparations like Asava and Arishta, Lehya (linctus), Vati/ Gutika (tablets) etc. Agnimandya (slow digestive power) is considered as the root cause of all disorders in Ayurveda, especially gastrointestinal disorders. Hinguvachadi Churna is a time tested formulation widely used by Ayurvedic practitioners for correcting the digestive power of our body. There are 24 constituents in this formulation and is indicated in the management of certain specific disease conditions originated because of Vata and Kapha humour. Modern scientific world always need explanations and logic behind the mode of action of various Ayurvedic procedures. This review is an attempt to explain the mode of action of this formulation. On analysing the properties of the ingredients, it was found that it is predominant of Katu rasa (pungent taste), Ruksha (dry) Teekshna (sharp) Guna (property), Ushna veerya (hot potency), Katu vipaka (pungent taste after bio transformation). These properties are responsible for the various pharmacological action of the formulation in Ayurvedic terms. As per modern pharmacology, phytoconstituents of many herbs are having action concerned with motility and secretions of Gastrointestinal tract, ultimately resulting in improved digestive capacity of our body. Analysis of mode of action gives a deep insight about the usage of formulations with a better understanding. The physician can apply his logic to use the medicine in contexts other than indicated.

KEYWORDS: Hinguvachadi churna, Mode of action, Ayurveda.

INTRODUCTION

Hinguvachadi churna is a time tested formulation, widely used in the management of various disorders, especially gastro intestinal disorders because of vitiation of Vata humour, Kapha humour and Ama (undigested form of food).[1] Modern scientific world always need explanations and logic behind the mode of action of various Ayurvedic procedures. This is a humble effort to explain the mode of action of this formulation, which is highly effective to correct digestive imbalances with predictive result. It is described in various Ayurvedic textbooks like Bhaishajya ratnavali, Sahasrayogam, Yogaratnakaram etc. I have selected the description in Ashtanga hridayam, Gulma chikitsa chapter.

MATERIALS AND METHODS

There are 24 constituents in this formulation (Fig 1), which includes 2 Ksharas (alkali preparations) and 3 Lavanas (salts).

| Drug | Rasa (taste) | Guna (property) | Veerya (Potency) | Vipaka (Biotransformed taste) | Karma (action) of ingredients |
|------|--------------|-----------------|-----------------|------------------------------|-----------------------------|
| हिंगुः | Pungent      | Hot, sharp, light, unctous | Hot              | Pungent                      | Vatakapha alleviating, increase Pitta, digestive, carminative, relieves colicky pain, abdominal lumps, flatulence, worms |
| वचा | Pungent, Bitter | Sharp, Light | Hot | Pungent | Kaphavata alleviating, digestive, relieves constipation, abdominal distension, colicky abdominal pain, worms |
| प्रिया | Astringent, Sweet, Sour, Bitter, Pungent | Light, dry | Hot | Sweet | Alleviates Tridosha, digestive, carminative, relieves haemorrhoids, swelling, ascites, worms, sprue, constipation, abdominal lumps, flatulence, vomiting, splenomegaly, urinary obstruction, dysuria |
| पशुगन्धा | Pungent | Light, sharp | Hot | Pungent | Alleviate Kapha, Vata, worms, colicky pain |
| दादिम | Sour | Light, unctous | Slightly hot | Sour | Increase Pitta, alleviate Ama, Vata, Kapha |
| दीप्यक: | Pungent, bitter | Light, sharp, dry | Hot | Pungent | Alleviate Kaphavata, digestive, relieves vomiting, pain around urinary bladder |
| धान्यक: | Astringent, Bitter, Sweet, Pungent | Light, unctous | Hot | Sweet | Alleviate Tridosha, digestive, alleviates anorexia, indigestion, haemorrhoids, worms |
| पाठ | Bitter | Light, sharp | Hot | Pungent | Alleviate Vatakapha, colicky pain, vomiting, diarrhoea, worms, abdominal lumps, wounds (ulcer) |
| पुष्करमूल: | Bitter, Pungent | Light, sharp | Hot | Pungent | Alleviate Vatakapha, anorexia, pain in flanks |
| शठी | Pungent, Bitter, Astringent | Light, sharp | Hot | Pungent | Alleviate Vatakapha pv, constipating, relieves swelling, wounds, colicky abdominal pain |
| हपुष: | Bitter, Pungent | Light, dry | Hot | Pungent | Alleviate Vatarakta, (dha.ni), worms, anorexia, splenomegaly, pain around anus |
| अग्नि: | Pungent | Light, dry, sharp | Hot | Pungent | Alleviate Vatakapha, digestive, carminative, relieves sprue, swelling, haemorrhoids, worms |
| यवक्षार: | Pungent | Light, dry, sharp | Hot | Pungent | Alleviate Kapha, digestive, relieves haemorrhoids, sprue, splenomegaly, flatulence |
| स्वर्जकाशाः: | Pungent | Sharp | Hot | Pungent | Alleviate Vatakapha, Relieves abdominal lumps, flatulence, worms, ascites |
| शुण्ठी | Pungent | Laghu, unctuous | Hot | Sweet | Digestive, Alleviate Vatakapha, rheumatic fever, vomiting, colicky abdominal pain, swelling, flatulence, haemorrhoids, ascites, constipation |
| मरिच: | Pungent | Light, dry, sharp | Hot | Pungent | Alleviate Vatakapha increase Pitta, digestive, relieves colicky abdominal pain worms |
हपप्पली
Pungent

Light, unctuous, sharp

Both hot and cold

Sweet

Digestive, Alleviate Vatakapha

सैन्धव लवणः
Salt

Light

Cold

Sweet

Alleviate Tridosha, digestive, stomachic relieves anorexia

सौवचिल लवणः
Salt

Light, clear, penetrating

Hot

Sweet

Alleviates Vata, increase Kaphapitta, laxative, digestive, constipation, relieves anorexia, colicky abdominal pain

विट लवणः
Salt

Light, dry, sharp, spreads quickly in body before digestion

Hot

Sweet

Alleviate Vatakapha, digestive, relieves anorexia, constipation, colicky abdominal pain, flatulence

अजाजी
Pungent

Light, dry

Hot

Pungent

Alleviate Vatakapha, increase Pitta, stomachic, digestive, constipating, relieves anorexia, abdominal lumps, vomiting, diarrhoea

चव्यः
Pungent

Light, dry

Hot

Pungent

Alleviate Vatakapha, flatulence Kapha, increase Pitta, digestive, stomachic, laxative, relieves ascites, flatulence, splenomegaly, abdominal lumps

स्त्रित्रीणिकः
Sour

Light, dry

Hot

Pungent

Alleviate Vatakapha, digestive relieves diarrhoea, anorexia

वेतसामः
Sour

Light, dry

Hot

Pungent

Alleviate Vata, laxative, relieves abdominal lump, colicky abdominal pain, wounds

Analysis
Of the 24 ingredients of Hinguvachadi Churna, 17 are having pungent taste, 3 having salty taste, 1 with sweet, 1 with bitter and 2 with sour as predominant tastes. All are light (easily digestible), 10 are dry, 5 with unctuous, 12 with sharp, 1 with spreading quickly nature before digestion, 1 with penetrating and 1 with clear properties. 22 of 24 drugs are having hot potencies, 1 with slightly hot potency and 1 with slightly hot and slightly cold potency. Regarding biotransformed taste after digestion, 14 are pungent, 7 are sweet and 3 are sour. As far as action on bio humours are concerned, 17 alleviate Kapha vata, 3 alleviate three biohumours, 1 alleviates Vata, Rakta, 1 alleviates Vata and alleviates Kapha.

Dashaimani’s (group of 10 best herbs with digestive action) of Charaka Samhita in which constituents are included

Hingu - Deepaneeya Gana
Vacha- Triptighna
Vijaya- Arshogha, Jwaraghna
Dadima- Hridaya, Chardhinigranaha
Deepyaka- Shoolaprashamana, Deepaneeya

Dhanyaka- Trishna Nigrahana
Chitraka- Deepaneeya, Triptighna, Bhedaneeya, Arshogha
Shunti- Triptighna, Arshogha, Deepaneeya, Soolaprashamana, Trishnanigranaha
Maricha- Deepeneeya, Shoolaprasamana, Krimighna
Pippali- Triptighna, Deepeneeya, Soolaprasman
Ajaaji- Soolaprasamana
Chavyam- Triptighna, Arshogha, Deepeneeya, Soolaprasamana

Dose: 3gm-6gm twice daily

Dosage: Powder (चूर्ण), (widely used in tablet form also as Hinguvachadi Gutika, triturated using Panchakola decoction, Jambeera rasa (lime juice), Ardraka rasa (ginger juice)usually which are Agnideepaka dravyas).

Time of Administration
It depends on the condition in which medicine is prescribed, as it is indicated in various diseases.

Prakbaktha: In Apanavata vitiation: Eg. Vasti ruja
Madhyabhakta: In Samana vata vitiation: Eg: Nabhi ruja
**Therapeutic uses other than textual indication**

Indications

- Colicky abdominal pain due to spasm in internal organs like urinary bladder, malabsorption syndrome, IBS, Kashtarthava (primary dysmenorrhea), hyperacidity, flatulence, urinary colic, dyslipidaemia, renal colic, pleural pain, achalasia cardia, intercostal myalgia, Atonic bladder.

- Another important use is that it is used in Kashayavasti (decocion enema) the form of Kalkka (fine paste)/Kashaya (decocion)

**Probable Mode of Action**

On the analysis of properties of Hinguvachadi churna, it was found that drugs are predominant in Katu rasa (pungent taste), Laghu (light) Ruksa (dry) guna, Usna Virya (hot potency) and Katu Vipaka (pungent after biotransformation), Tikta (bitter), Kashaya (astringent) and Amla Rasa (sour taste) is also present in very few ingredients. Bitter taste has Agnivardhaka (digestive), Ruchya (relieves anorexia) and Mukha Shodhaka (cleansing mouth) properties, so it increases appetite and improves digestion. Astringent property has the property of Asravishodhana (purifying blood). Sour taste of Punica granatum, Garcinia Morella has properties like which improves digestion, increases appetite. Its Hriya (pleasing to mind) property reduces nausea and vomiting. Sour taste also has the property of Muda Vata Anulomana (normalises movement of Vata). Pungent taste increases appetite and improves digestion which brings about Srotoshodhana (cleanses body channels). Light and dry properties of the drugs pacify Kapha vitiations if any, Sara (mobility), Usna (hot), Tikshna (sharp) and Sookshma (penetrating) properties of the drugs in the formulation remove obstruction by Kapha humour and thus allow normal movement of Apana Vata (a sub classification of Vata humour). Hingvachadi Churna mostly contains drugs having hot potency which pacifies vitiated Vata and Kapha. Most of the drugs in the formulation have pungent biotransformation which also pacifies vitiated Vata and Kapha. Vata Anulomana (normalising movement of Vata humour), Shulahara (relieving abdominal colic), Shothahara (relieves swelling), Srotavishodhana (clears body channels) properties of drugs of Hingvadichurna facilitates normal flow of Vata and alleviates Kapha. This renders the indigested food into the assimilable form and the normalised Agni leads to subsidence of disease.
Probable mode of action (In each indication)

**Pain in the precordial area, flanks, area around urinary bladder, anus, vulval/vaginal area (perineum), low back pain**

Formulation is specifically indicated in Vatakaphaamajarogas (originated due to vitiated Vata, Kapha and indigested food). 20 out of 24 constituents are Vatakaphahara (alleviates Vata and Kapha). All constituents are having Amapachana (stomachic), Deepana (digestive) properties. 23 out of 24 constituents are Vatadoshahara (alleviates Vata). Soola (colicky abdominal pain) is a Nanatmaja Vikara of Vata Dosh. Moreover Soolahara (alleviating Soola) action is specifically mentioned for Ferrula asafoetida, Acorus calamus, Terminalia chebula, Cleome gynandra, Cyclea peltata, Hedytosis corymbosa, Zingiber officinale, Piper nigrum, Sorchal salt, Garcinia morella. Also, Inula racemosa is the Aghya Oushadha (best medicine) mentioned for Parswasaola (pain in flats). Apium graveolens is having Vastirujahara (relieving pain around urinary bladder) property. Sphaeranthus indicus is described to have Gudarthihrit (relieving pain related to anus, rectal region) property.

**Abdominal lumps (Gulma)**

Gulma is considered as Tridosha, Vata predominant disorder. As per Ayurveda abdominal lump caused due to aggravation and encapsulation of Vata Dosh which spreads widely like shrubs/lump (Gulmawat Vishalataawaat). It is usually known as tumor of abdomen. When there is obstruction in the Rasavaha srotas (channels carrying Rasa tissue), it results in Agnimandya (decreased digestive capacity), progressing to Gulma. 23 out of 24 constituents alleviates Vata dosha. Specifically Gulmahara property mentioned for Ferrula asafoetida, Terminalia chebula, Cyclea peltata, Sodium bicarbonate, Cuminum cuminum, Piper chaba, Garcinia morella. All constituents are stomachic and digestive. Cleansing property of channels of formulation also supports it.

Pungent taste and hot potency of Zingiber officinale removes obstruction in channels. Piper longum due to its pungent taste and hot potency increases biofire by which digestion of indigested food occurs. Due to the above factor Gulma originated by Ama subsides. Apium graveolens is helpful in normalising movement of Vata. Piper longum increases biofire and thereby reduces blockage in the microcirculatory channels. Ferula asafoetida, Piper longum, Z. officinale and Apium graveolens are prescribed as wholesome diet for Gulma. Piper nigrum by its hot potency and pungent taste increases biofire; by sharp, hot property expels the vitiated Doshas which are in Sanchaya Avastha (accumulated stage). Pramath Guna (property of expelling vitiated Doshas form channels forcefully) of P. nigrum helps in Srotoshodhana.

**Vata, Vip, Mootrasangam** (obstruction in the movement of Vata humour, faeces, urine, Kante Bandham (Obstruction in throat), Hrit Graham (Feeling of constriction in the precordial area))

Vatavidrighi and Rudhagati (vitiation and obstructed movement of Vata humour) is the cause for the conditions. Most of the constituents are normalise movement of Vata, especially Acorus calamus, being Pramathibhi. The Ushna, Teekshna property of the drugs help to clear vitiated Vata in the digestive tract, treating bloating, flatulence, colic and undigested food in the stool; it moves Samana Vayu and draws Apana Vayu down. Terminalla chebula is Vatanulomaka, Vibandhahara (removes obstruction) and is indicated in Mutrakkrichra (dysuria) and Mutraghata (obstructed movement of Vata). Z. officinale, vida salt is Vibandhahara. Sorchal salt is Malabhedaka (helps in the passing of faeces, urine). Piper chaba is Bhedi (laxative). G. morella is Rechani (laxative). Due to strong pungent taste, formulation purifies the tongue and throat and thus relieves obstruction in throat. Vatahara property relieves feeling of constriction in the precordial area and drugs with sour taste are pleasing to mind and good for heart.

**Annasradha/Adhmana/Agnisadam/ Pandu rogam** (Conditions like Anorexia, abdominal pain, loss of appetite, Indigestion, sprue, bloating, belching, flatulence/ Anaemia)

Agnimandya (decreased biofire) is the cause, Deepana (digestive) property at its best gradient of all drugs help to relieve this, especially P. longum, P. nigrum, Z. officinale, P. zeylanica, Z. kshara, F. asafoetida, Apium graveolens, C. sativum, C. cuminum, P. chaba. Drugs due to its pungent taste and hot potency increases the digestive fire. Many drugs have Ruchyam (relieves anorexia). Pramath Guna of P. nigrum helps in removing obstruction of channels and is indicated in indigestion, colicky abdominal pain and flatulence. Synonyms, Agni of P. zeylanica and Deepyaka of A. graveolens implies the Agnideepana property of the drugs. Ksharas are said to be Agni Samnibha (equal to fire)

**Pleeha** (Splenomegaly). **Durnama** (Haemorrhoids), **Vridhi** (Conditions like Ingual hernia, hydrocele)

These are diseases due to vitiation of Vata, Kapha. Vatakapha alleviating property of the formulation helps. T.chebula, S.indicus, Hordeum vulgare ash, P. chaba are specifically indicated in the disease, Splenomegaly. P. longum is the Aghyasushada (best medicine) mentioned for Splenomegaly, by its Srotoshodhaka (cleansing channels) & Rasayana
(nourishing Dhatus) property, nourishment of tissues take place. P. zeylanica, Hordeum vulgare ash, Z. officinale is indicated in haemorrhoids.

**Hidhma (hiccup), Swasa (dyspnoea), Kasa (cough)**

These are Vata predominate conditions. Normalising the movement of Vata is the treatment principle. Pungent taste, hot potency helps in this. *Inula racemosa* is said to be the best medicine for condition associated with pain in flanks, dyspnoea, cough.

**Probable Mode of Action in Dyspepsia- Modern Pharmacology**

- In dyspepsia (*Agnimandya* and related conditions): Galactone and diterpenoids isolated from ginger exhibited anti 5HT effect (5HT receptors are concerned with gastric motility and secretions in the gut). Function as digestive aids; has anti-ulcer, anti-emetic and chologogic (Increases the biliary secretions) properties. In experimental animals, 36 Gingerol and shogaol, active components of Ginger, reduce gastric contractions but increases gastro intestinal motility and spontaneous peristalsis activity. P. longum exhibited substantial anti-ulcer activity. It resulted in significant increase in mucin secretion and mucosal glycoprotein and marked decrease in cell shedding, showing anti-ulcer effect. It acts as a catalyst; increase the action of other herbs. Acts as bioavailability enhancer by enhancing gastro intestinal absorption and causing thermogenesis. Both piplartine and alcoholic extract from the stems exhibited significant inhibition of ciliary movements of oesophagus of frog, which avert heartburn and nausea in hyperacidity.

- *Ajamoda (A. graveolens)* produces contraction of the isolated ileum, tracheal chain and bronchial musculature in guinea pigs.

- *Lavana* (salts) helps soften food and make it easily digestible, aids secretion of saliva and gastric juices. It also softens the mucus membrane. It acts as carminative, digestive and stomachic properties.

- *F. asafoetida* significantly reduces the gastric volume, total acidity, free acidity, and increase the pH of gastric juice. So *Hingu* is preferred, when *Adhmana* and *Shula* are the chief complaints.

- *Trikatu* in total is known to influence the bioavailability of drug, Piperine in particular functions as bioavailability enhancer by improving gastro intestinal absorption and inducing thermogenesis.[6]

- Moreover, ingredients of *Hingvachadi churna* functions as digestive stimulant by different enzymatic secretions. Oral administration of Piperine, Cumin, Asafoetida, A. graveolens, as a single dose significantly stimulates the liver to produce bile rich in bile acids, which play a very significant role in fat digestion and absorption. Proteins, starch and triglycerides, the major macromolecules in food are hydrolyzed by the major pancreatic enzymes- proteases (trypsin and chymotrypsin), amylase and lipase respectively. The dietary intake of spice principles Piperine, Ginger, Asafoetida, and Ajowan significantly enhance lipase activity. Pancreatic amylase activity is induced by dietary ginger.

- The study on antispasmodic and antidiarrhoeal activity of *Acorus calamus* revealed that plant extract causes the spontaneous inhibition of high K (+) induced contractions which caused spasmolytic activity which is mediated through the calcium channel blockade. [7]

**Probable Mode of action in Soola (colicky pain)**

- Ginger (*Sunthi*) decreases both acetylcholine-induced and electrically-induced smooth muscle contractions. The spasmolytic property is accredited to gingerol, which also reduces the biosynthesis of prostaglandins (lipid compounds that have a role in pain perception) and serotoninergic activity.

- Ginger is also anti-inflammatory that aids in the management of pain and discomfort accompanying with inflammatory changes in the gastrointestinal tract. COX-1 and -2 enzymes are also inhibited by it.

- Celery (*Ajumoda*) also has spasmolytic action, which is particularly beneficial in decreasing gastrointestinal tract spasms. It has potent COX-1 and -2 inhibitory anti-inflammatory, santi-nociceptive and analgesic effect.

- Cumin also has analgesic, carminative and stimulant effects. It exhibits neurotropic anti-spasmodic action. Anti ulcerogenic activity of Cuminum cyminum has also been proved.

- In rats, colloidal solution of asafoetida exhibited anti ulcer effects in acute gastric ulceration induced by cold restraint stress, aspirin and pylorus ligation.

- In the stomach of rats, *Piper longum, Zingiber officinalis* and Ferula species augment mucin secretion and decrease cell shedding.

- Asarone of *Vacha* has a relaxing effect on smooth muscle tissue, relieving the spasm.
Terminalia chebula extract showed antisecretory activity in pylorus ligated model which lead to significantly increased gastric Ph, reduction in the gastric juice volume, free acidity and total acidity.[8]

The ethanolic extract of Cyclea peltata roots showed significant antisecretory activity by decreasing pepsin secretion, gastric juice volume and acid output in pylorus-ligated rats. Further, it showed significant gastroprotective effects.[9]

Probable Mode of Action in Gulma (Abdominal lump)

Ginger has got anti-cancer and anti-inflammatory activity by inactivating NFκB by suppressing pro-inflammatory TNF-α 71.

Piplartine & piperene of piper compounds has antiabdominal tumor mechanisms of action. Piplartine compound destroys cancer cells by targeting the stress response to reactive oxygen species (ROS). Piplartine induces selective apoptosis in cells which have a cancer genotype by targeting a non-oncogene co-dependency attained through expression of the cancer genotype in response to transformation-induced oxidative stress.

Piperine is a chief component of black (P. nigrum) and long (P. longum) pepper. The content of piperine in black pepper varies from 5% to 9%. Piperine can inhibit human fibrosarcoma (HT-1080) cell expression of matrix metalloproteinase (MMP)-9, thus interfering with tumor cell invasion and migration.

The essential oil present in Carum Carvi is used as a cancer preventing agent. It is also known to boost the immune system.

Asafoetida contain essential oil (10-17%) having antioxidant action and is a cancer chemo preventive agent.

In mice, Lectins of A. calamus have inhibitory effect on the growth of some neoplastic cell lines.

Chebulagic acid of Terminalia chebula, showed potent dual inhibition against COX and 5-LOX. It also exhibited anti-proliferative activity against HCT-15, COLO-205, MDA-MB-231, DU-145 and K562 cell lines.

Treatment of HT-29 colon cancer cells has been indicated by P. graminum juice by reducing COX-2 expression and inflammatory cell signaling that may cause cancer initiation and progression.

NF-κB activation induced by TNF, other carcinogens and inflammatory stimuli was inhibited by Plumbagin.[10]

Biflavonoids 2, 3, and 5 of Rhus parviflora showed significant cytotoxicity.

Garcinia morella fruit extract significantly reduced the release of nitrate and TNF-α level of LPS induced RAW 264.7 cells and resulted in anti-inflammatory effect.

Probable Mode of Action in Swasa (dyspnoea), Kasa (cough)

Crude extract of Acorus calamus showed significant carbachol response with the blockage of calcium channels by anti-cholinergic and anti-depressant effect.

Sitosterols and glucosides of Hedychium spicatum[11] and Inulin of Pushkaramool[12] has marked anti 5HT and anti histaminic activities which caused bronchodilatory effect.

CONCLUSION

Hinguvachadi churna is a time tested formulation, widely used in the management of various disorders, especially gastro intestinal disorders of Vata, Kapha, Amaja origin. There are 24 constituents in this formulation. It is mainly Katu rasa, Laghu ruksa teeksha guna, Ushna veerya, Katu vipaka pradhana. These properties are responsible for the various pharmacological action of the formulation in Ayurvedic terms. Many ingredients are even included in several Dashaimani groups of Charaka Samhitha like Deepaneeya, Soolahara, Triptighna which are related to its action. As per modern pharmacology, phytoconstituents of many herbs are having action concerned with motility and secretions of GIT, ultimately resulting in improved digestive capacity of our body. More researches should be done to evaluate the mode of action of this formulation and clinical studies to establish its efficacy.

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