A CRITICAL ANALYSIS OF RASONADI KASHAYA IN ISCHEMIC STROKE

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ABSTRACT

Stroke is undoubtedly a medical emergency, which even if properly managed can leave a person either physically or mentally crippled. Ischemic stroke is the most common form, where etiology of atherosclerosis had proven its link. The clinical features of stroke stands close to the disease Pakshaghata in Ayurveda and all Acaryas had given a detailed description regarding the Nidana (cause)–Samprapti (pathogenesis)–Bhedha (types) & Chikitsa (treatment). Ischemic stroke may be related to Vata-kaphaja type of Pakshaghata as there is involvement of Srotorodha (obstruction). Hence the treatment aims include Vata-kapha samana (pacifying) measures, removing Srotorodha (obstruction), selecting drug having Katu rasa (pungent), Usna virya (hot potency) etc. Without provocation Pitta. Rasonadi kashaya explained for Vatavikaras (musculoskeletal, nervous disorders etc) contains Rasona (Allium sativum Linn), Pippali (Piper longum Linn.), Karavi (Carum carvi Linn.) and Sthira (Desmodium gangeticum) that satisfies the above properties. The drugs also possess Rasayana (nourishing /immunity /prevents recurrence) which is a good choice here as there is Dhatuskhasha (catabolism of basic elements). Ayurvedic as well as modern analysis of the pharmacological properties of the drugs stands together with properties like anti-inflammation, anti lipidemic, antiglycemic, antioxidant, anti microbial actions, thus proving beneficiary in both therapeutic and preventive aspects of ischemic stroke.

KEYWORDS: Rasonadi kashaya, Ischemic stroke, Atherosclerosis, Pakshaghata, Vatavikaras, Ayurveda.

INTRODUCTION

Stroke is a clinical condition where rapid focal disturbance occurs, affecting cerebral function which if lasts more than 24 hours may lead to death, with no apparent cause other than vascular origin. Survival of brain cells for few seconds without blood supply can create irreversible damages in brain, which makes stroke fall into a crucial category that requires urgent sufficient management. Stroke as in majority of cases is a clinical manifestation of an unmanaged lifestyle disorder where the main culprits include DM,HTN, Hyperlipidemia etc. Hypercholesterolemia is a major risk factor for the development and progression of atherosclerosis and related cardiovascular diseases(CVD)which can lead to either haemorrhage or embolism or thrombosis resulting in cerebro vascular accidents. The most common form is Ischemic stroke followed by haemorrhagic stroke. Ischemic stroke occurs either due to thrombosis or due to emboli formation.

Older age, family history of thrombotic stroke, diabetes mellitus, hypertension, tobacco smoking, abnormal blood cholesterol [particularly, low high-density lipoprotein (HDL) and/or high low-density lipoprotein (LDL)], and other factors are either proven or probable risk factors for ischemic stroke, largely by their link to atherosclerosis. Risk of stroke is much greater in those with prior stroke or TIA. Many cardiac conditions predispose to stroke, including atrial fibrillation and recent MI.

Ischemic stroke [1]

Cerebral ischemia occurs when blood flow to brain reduces and lasts longer than several seconds. A fall in cerebral blood flow to zero can lead to ischemia, infarction and eventually death of brain cells. If blood flow is restored prior to a significant amount of cell death, the patient may experience only transient symptoms, i.e., a TIA. Ischemia leads to necrosis by neuron starvation of vital functions of cells. Fever and hyperglycemia worsens ischemia so it is reasonable to suppress fever and prevent hyperglycemia as much as possible. Attention is also directed towards preventing the common complications of bedridden patients infections (pneumonia, urinary tract, and skin) and deep venous thrombosis (DVT) with pulmonary embolism.

Ayurvedic concept of stroke

Ayurvedic view of stroke is more or less related to the disease Pakshaghata where the management significantly relieves their sufferings. It is explained as one among the Nanatmaja vyadhii (caused by Vata dosa alone) by Acarya Caraka in Sutra sthana.2) Madakovaka in Madava Nidana has explained two types Vatapaitika and Vatakaphaja Pakshaghata.3) Vata affects half of body and dries up Sira (blood vessels) & Snayu (tendons) leading to Vimaksha (loosening) of Sandhivandha (joints). As a result,
that part becomes inactive with loss of sensation. If there is association of Pitta with Vata, there will be burning sensation, warmth and syncope whereas association with Kapha produces cold touch, swelling and heaviness in body.

Samprapti ghatakas: (probable pathogenic factors happening in Ischemic stroke according to Ayurveda)

Dosa- Vata (Prana, Udana, Vyana)

Dusya- Rasa, Rakta, Mamsa, Meda, Majja, Sira, Snayu, Dhamani, Mala

Srotodusti- Sanga (Obstruction in cerebral vessels leads to ischemia-paralysis)

Ama- Ama formation- Srotorodha-dosa Prakopadhatukshaya (Thrombus/emboli-obstructs cerebral arteries - ischemia in brain tissue-necrosis).

All these causes Vataprakopa (aggravation of Vata), i.e., increase in Ruksha (dryness), Sita (cold) & decrease in Cala guna (movement). The atherosclerotic changes in the blood can be considered to be caused by aggravated Vata and Kapha which causes the cholesterol to accumulate in the blood vessel thereby obstructing the flow leading to infarction. Thus in infarction or ischemic stroke, Vatakaphahara chikitsa is done using Katu, Ruksha, Usna virya oushadhas.

A critical analysis is made on the action of Rasonadi kashaya satisfying above properties in Vata Kapha pakshaghata with respect to Ischemic stroke.

Critical analysis of Rasonadi kashaya in Pakshaghata

Rasonadi kashaya, explained in Sahasrayoga under Vyatanvakaras contain Rasona, Kaaravi, Pippali and Sthira as its contents. [4]

| Table 1: Ingredients of Rasonadi kashaya |
|-----------------|-----------------|-----------------|-----------------|
| Drug             | Botanical Name  | Family Name     |
| Rasona           | Allium sativum Linn. | Liliaceae       |
| Kaaravi          | Carum carvi Linn. | Umbelliferae    |
| Pippali          | Piper longum Linn. | Piparaceae      |
| Sthira           | Desmodium gangeticum | Leguminosae    |

| Table 2: Pharmacological properties of the drugs in Rasonadi kashaya |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Drug             | Rasa            | Guna           | Virya           | Vipaka          | Karma          |

Action of Rasona

Rasona has been extensively used since generations and properties like anti atherosclerosis, antimicrobial hypolipidemic, anti thrombosis, anti hypertension, anti hypoglycaemic has been evaluated scientifically.

Hypercholesterolemic activity.

Based on several interventional studies and animal studies, it has been found that the essential oil fraction of garlic comprises of 60% of diallyl disulphide (DADS) which showed hypocholesterolemic activity, especially in lowering total cholesterol and LDL cholesterol in humans. The cardiovascular protective effects of garlic have also been explored in recent years. [14,15]

Action of Karavi [16]

C. carvi seeds had undergone many pharmacological and clinical studies that revealed its potential as antimicrobial, antifungal, antibacterial, anti hyperglycemiac anti hyperlipidaemic, anti ulcerogenic, antiproliferative, antidiyspeptic, antitumor, molluscidal insecticidal, nematicidal, antioxidant, and anti cancer agent.

Hypoglycaemic activity

The fruit extracts of these plants has a potential to exert a hypoglycemic effect by inhibiting hepatic glucose production and/or by stimulating glucose utilization by peripheral tissues, especially muscle and adipose tissue. The plant extracts could also act as inhibitors of tubular renal glucose reabsorption.

Hypolipidemic activity

Flavonoids and carvone in C.carvi have been found to have strong anti-oxidant activity which showed potent lipid lowering activities especially triglycerides.

Anti-inflammatory activity

Carvone, the most important component of C. carvi, known as an anti inflammatory agent act as a Ca channel blocker and also inhibits 5-lipoxigenase and cyclooxygenase activity thus decreasing the biosynthesis of leukotriens and prostaglandins.

Antioxidant, anti bacterial, antifungal, antistress, nootropic, anticolitic, antifertility activities have also been studied.

Action of Pippali [17]

Piperine, a compound isolated from P. longum act as CNS depressant, antipyretic, analgesic, anti-inflammatory, antioxidant and possess hepatoprotective activities.

Anti-diabetic activity

Pharmacological and clinical studies have elucidated the anti-hyperglycemic and anti-hyperlipidemic effects of Piper longum root aqueous extract (PlrAqe) in streptozotocin (STZ) induced diabetic rats. It has been...
suggested as a source for isolating new oral anti-hypoglycemic agents.

**Cardio protective**

It is proposed that the methanolic extract of *P. longum* (MePL) which contained compounds like alkaloids and amides, lignans, esters and volatile oil prevents the histopathological and biochemical changes in rat model induced of myocardial infarction, thus providing a cardio protective effect. [18]

**Anti-inflammatory and Anti-arthritic activity**

*Piper* extracts and piperine possess inhibitory activities on prostaglandin and leukotrienes thus exhibiting anti-inflammatory activity. Piperine posses immunomodulatory activity which in turn showed anti-arthritic effect in arthritis induced rats.[19]

**Anti-apoptosis and antioxidant**

The anti-apoptosis and antioxidant activity of *P. longum* through TUNEL ASSAY and Radical scavenger activity (DPPH ASSAY) has also been evaluated. [20]

**Hypolipidemic activity**

Methyl piperine significantly inhibited elevation of total serum cholesterol.

**Bioenhancer**

Piperine was found to have property to modulate membrane dynamics of structurally and therapeutically diverse drugs so as to enhance its bioavailability.[21,22,23]

**ACTION OF STHIRA**

Gangetin in *Sthira* have been found to have anti - inflammatory action in the exudative and proliferative phases of inflammation.[24] The aerial parts exhibited antidiabetic action by increasing insulin secretion from the existing beta cells.[25] Presence of chlorogenic acid (0.12%) in it has an established lipid lowering potential.[26] *Sthira* contains polyphenols such as caffeic acid and chlorogenic acid, which are reported antioxidants in the flavonoid fraction.[27] Flavonoid fraction exhibited anti-inflammatory activity and analgesic property.

**Cardio protective effect**

The roots have hypcholesterolemic and antioxidant functions and prevent myocardial degeneration and myocardial necrosis during MI. It is antioxidant against revascularization injury[28] and improves the cardiac function, by improving the level of these cardiac enzymes like CK, LDH, SGOT etc.

**Gastro protective** [29]

The ability to increase regeneration of damaged gastric mucosa makes it gastro protective. Whole plant has antibacterial action. [30]

**DISCUSSION**

After analysing Ischemic stroke in Ayurvedic view, the main aims in *Chikitsa* (treatment) include removing Srotosanga (obstruction from vessels), correcting Vishamagni (imbalance in digestive fire) and Amapachana (rectifying *Ama*).The drugs should posses Kaphavata samana property, Katu rasa pradhana (pungent) and Usna virya (hot potency). But care must be taken to avoid provocation of *Pitta* as *Pittaparakopa* (aggravation of *Pitta*) can vitiate Raktadhatu (blood) which in turn vitiates Siras (vessels) and *Kandaras* (ligaments) which are the *Upadhatu* of Rakt. Hence *Rasonadi kashaya* becomes a good choice as it is a balanced formulation with *Kapha* vata samana property, *Madhura-katu rasa* & *Usna virya*. At the same time, it is *Balya* (strengthening), *Bhrmhana* (nourishing) and *Rasayana* (rejuvenation) which eradicates Dhatukshaya and Vatakopa caused by Srotorodha. Except Karavi, all other drugs posses Snigdha Gun (unctuousness) to avoid excess *Rukhsha* (dryness) to *Dhatu* (tissues).

A large number of studies have been conducted on the contents of the *Kashaya* (formulation), i.e., *Lasuna*, *Pippali*, *Karavi* and *Sthira* to explore the full potential of its pharmacological actions.

From the pharmacological activities reported so far, it is quite clear that *Allium sativum*, *Desmodium gangeticum*, *Piper longum* & *Carum carvi* possesses good antioxidant properties, which facilitates its action as an anti-inflammatory, anti-hyperlipidemic, cardioprotective, anti-aminergic, anti-diabetic, gastroprotective, hepatoprotective, neuroprotective and antimicrobial properties. Thus we can conclude that, *Rasonadi kashaya* possessing hypoglycemic action, hypolipidemic action, cardio-protection action, anti-oxidant action, anti-inflammatory action prevents complications/risk factors in ischemic stroke due to Diabetes mellitus, Hyperlipidemia, atherosclerosis, free radical formation, thrombi or emboli formation respectively.

**CONCLUSION**

The risk factors in Ischemic stroke includes Diabetes mellitus, Hypertension, hyperlipidemia, formation of free radicals, emboli, thrombus etc as they are all linked to atherosclerotic activity. Hence a drug having Hypoglycemic action, Hypolipidemic action, Cardio protective, Antioxidant, anti inflammatory action is essential in both preventive and curative aspects, where Rasonadi kashaya finds its place as its ingredients has been proven for their efficacies in many studies.

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**REFERENCES**


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