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Scientific Explanation for Using Purgation Therapy in Tamaka Shwasa (Bronchial Asthma)

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ABSTRACT

Ayurveda emphases on three fold therapeutic management of the diseases viz; *Samshodhana* (purification), *Samshamana* (pacification) and *Nidana Parivarjana* (avoiding causative factors). Panchakarma is the therapeutic technology of *Samsodhana.* Panchakarma is the integral part of Kayachikitsa (general medicine).It consists of five main purification procedures namely, *Vamana* (emesis), *Virechana* (purgation), *Basti* (administration of drug through rectum/ urethra/vagina), *Raktamokashana* (bloodletting) and *Nasya* (administration of drug through nasal route). According to Ayurveda palliative therapy given after purification therapy is more useful thus it should be given prior to palliative therapy in every disease. Tamaka Shwasa is a disease described in Ayurvedic texts that shows close resemblance with bronchial asthma on the basis of clinical manifestations. Due to exhausting and prolonged conventional treatment majority of asthmatic patients opt Ayurvedic treatment for better results, and maximum (especially those who take treatment at early stage) get significant relief. Managing Bronchial asthma on Ayurvedic line of treatment is totally different from that of conventional management. Clinical validation of a therapy further required scientific explanation and justification for its global acceptance. Thus in this paper an attempt is made to search the probable scientific reasons for the action of purgation therapy in Tamaka Shwasa (Bronchial asthma).

Keywords: *Virechana*, Purification, Bronchial asthma.

1. Introduction

Bronchial asthma is a major disabling respiratory tract disease. Patient get distressed due to chocking of airways and become restless due to lack of proper oxygenation. If one is deprived by essential of life definitely the problem is serious. Majority of patient suffering from this dreaded disease come in shelter of Ayurveda for proper management. In Ayurvedic system of medicine purification therapy get more importance than palliative therapy. In Ayurveda purification therapy is the major treatment procedure for approximately every disease (except one). Though terminology of disease are different in modern and Ayurvedic system of medicine, but on the basis of clinical manifestations they can be correlated. Tamaka Shwasa is a disease described in Ayurvedic texts shows similarity with bronchial asthma and Ayurvedic physician use to treat asthmatic patients according to line of treatment of Tamaka Shwasa. According to Ayurveda Tamaka Shwasa originated from *Annavisha* (food toxins) and therefore firstly it should be removed from the body. The procedure which is use for elimination of toxins from alimentary tract through rectum is known as *Virechana* (purgation). Ayurveda advocate use of *Virechana* for the treatment of Tamaka Shwasa. From decades it is well proved/ established fact that clinically patient gets benefited by *Virechana*. This seems very amazing that a disease of respiratory tract gets cured by purgation therapy. In this paper we try to explore the scientific explanation for the probable mode of action of *Virechana* (purgation) in Tamaka Shwasa.

2. Probable Mode of Action of *Snehana* and *Swedana* Before Virechana:

Oleation (*Snehana*) and Sudation (Swedana) prior to Virechana helps in dissolving the intracellular toxins and expel them into exterior of cell from where they are thrown outside the body**.** Scientific explanation for this whole procedure can be summarized as:

- Passive diffusion is the most important mechanism for majority of drug transport.
- Lipid soluble drugs diffuse by dissolving in the lipoidal matrix of the membrane, the rate of transport being proportional to lipid: water partition coefficient of the drug. A more lipid soluble drug attains higher concentration in the membrane and diffuses quickly.
- As temperatures increases, (externally by sudation) both the cell membrane and the proteins can be affected. The fatty acid tails of the phospholipid bilayer can "melt" at high temperatures meaning that they become more fluid and allow more movement. This affects the permeability of the cell which increases [1].
- The osmotic pressure of a solution may be calculated from Van't Hoff's Law:
  P = iRTc

where i is the number of ions formed by dissociation, R the ideal gas constant, T the absolute temperature and c the molar concentration.

Heat is expected to enhance the body fluid circulation, blood vessel wall permeability, rate-limiting membrane permeability, and drug solubility. According to Kligman, diffusion is a temperature-dependent process, so raising the skin temperature should add thermodynamic drive. Heat is known to increase the kinetic energy of the drug molecules and the proteins, lipids, and carbohydrates in the cell membrane. Heating prior to or during topical application of a drug will dilate penetration pathways in the skin, increase kinetic energy and the movement of particles in the treated area, and facilitate drug absorption. Heating the skin after the topical application of a drug will increase drug absorption into the vascular network, enhancing the systemic delivery but decreasing the local delivery as the drug molecules are carried away from the local delivery site [2,3]. Knutson recently investigated the mechanisms involved in temperature-enhanced skin permeability. Results indicated that the increased skin permeability of lipophilic drugs results from temperature-induced alteration of the lipid structure, which involves the disordered arrangement of the lipid bilayer structure and its fluidization. Further studies indicate that temperature changes of approximately 5°C are necessary to cause measurable changes in cell membrane permeability.

External heating induces changes in hemodynamics, body fluid volume, and blood flow distribution, which in turn may affect the pharmacokinetics or bioavailability of administered drug. The body's initial response to heat is peripheral vasodilation followed by perspiration, which results in a large fraction of the total blood volume being circulated through the skin vessels for cooling.

Table 1: Solubilities of several drugs at different temperatures

Drug Temperature	(ºC)	Solubility (g/100 mL)	Percent Increase
Barbital	20 37	0.629 0.949	138%
Phenobarbital	20 37	0.088 0.184	209%
Sulfadiazine	20 38	0.00616 0.0099	161%
Tolbutamide	27 37.5	0.0077 0.0142	184%

3. Diaphoresis, or sweating, is one of the Six Hygienic Purification Methods of Greek Medicine. It cleanses the blood by releasing toxins via the sweat.

3.1 Mechanism of action of Virechana dravya:

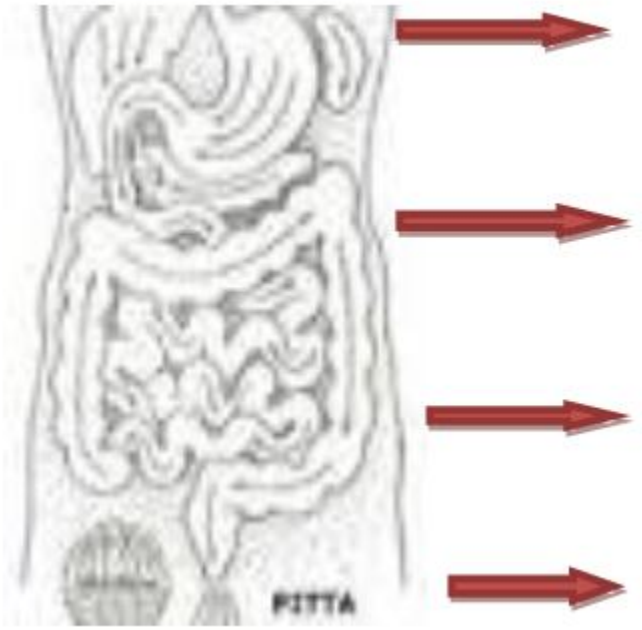
According to modern science: Laxatives modify the fluid dynamics of mucosal cell and may cause fluid accumulation in gut lumen by one or following ways:

- Inhibiting Na + K+ ATPase of villous cells – impairing electrolyte and water absorption.
- Stimulating adenylyl cyclase in crypts cells- increasing water and electrolyte secretion.
- Enhancing PG synthesis in mucosa which increase secretion.

Structural injury to the absorbing intestinal mucosal cells.

3.2 Action of virechana

- Decreased intra-abdominal pressure thus helpful in dyspnea due to ascitis etc.
- Depress respiratory center and prevent hyperventilation
- Remove undigested food material and prevent stimulation of inflammatory mediators
- Decreased water and electrolyte absorption deplete extracellular fluid to lesser extent thereby decreasing blood pressure.



3.3 How Virechana is more beneficial than Vaman in Tamaka Shwasa

- Due to more probability for development of complications.
- As 80% of Bronchial Asthma suffers from Gastro reflex oesophagitis there may be maximum chance for erosion of oesophageal mucosa and upper gastrointestinal bleeding.
- Emesis may cause electrolyte imbalance and thereby disturbing the haemodynamic that may worsen the Heart failure & Kidney failure like condition. Thus it should be avoided in Cardiac asthma & renal asthma.
- As CTZ (chemoreceptor trigger zone) & NTS (nucleus tractus solitarius) itself express a variety of receptors e.g. histamine H2, dopamine D2, serotonin etc through which the emetic signals are relayed any factor that lead to secretion of these inflammatory mediator if present in GIT can itself provoke emesis. Histamine has dominant physiological role in controlling HCl secretion. Gastric glands have H2 receptors thus emesis help in reducing histamine level in GIT but not able to disrupt the pathogenesis of Bronchial asthma (smooth muscles of bronchus has H1 receptors).

4. Herbs Used For Virechana

4.1 Operculina turpethum

Operculina turpethum is having Anthraquinone glycoside also known as emodin. Unabsorbed in the small intestine, they are passed to the colon where bacteria liberates the active antiroll form , which either act locally or absorbed into circulation –excreted in bile to act on small intestine. The active principle is believed to work on myenteric plexus to increase peristalsis and decrease segmentation.

- Water extract of the plant causes mild to moderate relaxation of the isolated guinea-pig ileum and also counteract Acetylcholine.

4.2 Cassia fistula

Cassia fistula's laxative actions come from a group of well documented compounds called anthraquinones that are found in all Cassia and Senna plants in varying degrees.

Its main property being that of a mild laxative is more suitable for children and pregnant women.

It is also a purgative due to the wax aloin and a tonic and has been reported to treat many other intestinal disorders like healing ulcers[4].

The plant has a high therapeutic value and it exerts an antipyretic and analgesic effect[5]. Besides, it has been found to exhibit antinflammatory and hypoglycaemic activity [6].

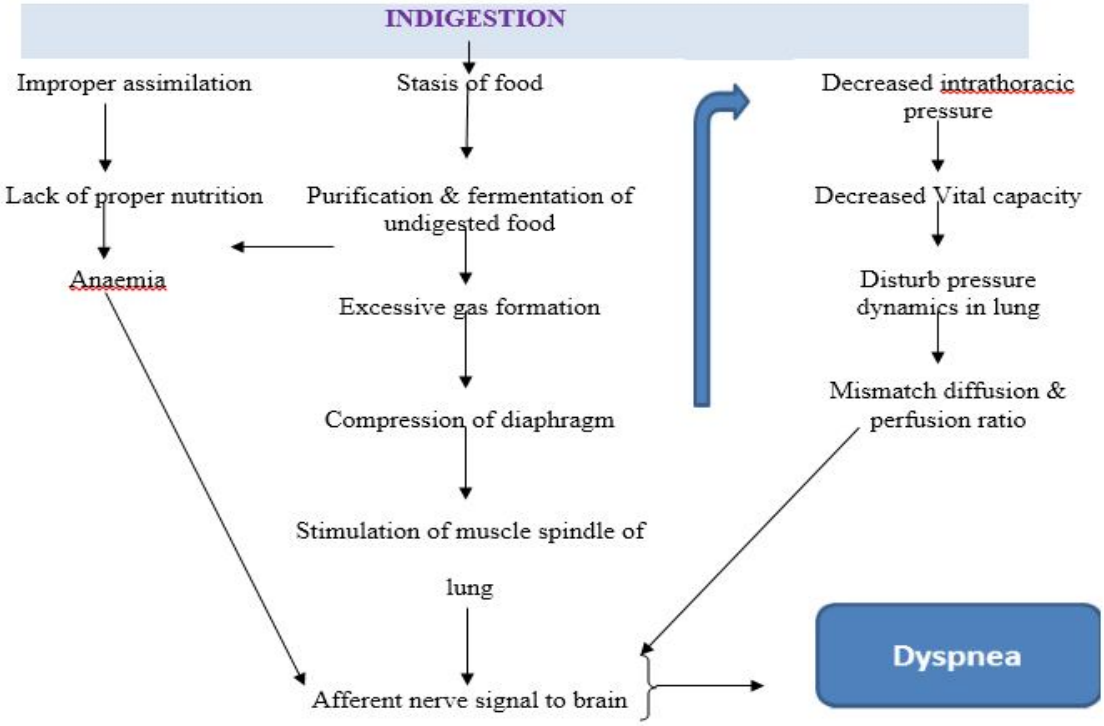


Fig: Diagrammatic representation of Mode of Action of Virechana in Tamaka Shwasa

4.3 Terminalia Chebula:

- Shows antibacterial and antifungal properties help in preventing bacterial overgrowth in gut. It has potent action against E.Coli, H.Pylori.
- Having anti-allergic action prevent mast cell degranulation and release of histamine.
- It has anti-oxidant effect because it is found to inhibit the lipid peroxidation and reduce the production of Anion superoxide.
- Act as Prokinetic drug and found to be very effective in Diabetic Nephropathy.

4.4 Castor Oil:

- It is one of oldest purgatives.
- It mainly contains triglyceride of ricinoleic acid which is polar long chain fatty acid.
- It is hydrolysed in the ileum by lipase to ricinoleic acid and glycerol.
- It is believed to irritate the mucosa and stimulate intestinal contractions.
- The primary action is supposed to be decreased intestinal absorption of water and electrolyte and enhanced secretion by a detergent like action on mucosa.

5. Conclusion

- Virechana here signifies *Vatanuloman* which can be done either with *Mutravirechaniya dravya* as in case of Cardiac related Dyspnea or with *Malavirachaniya dravya* as in respiratory and metabolic related Dyspnea.
- Here *Malavirechana* refers *to Kosthsudhi/ Malasudhi* i.e. regular use of *mridu anulomaka virechana.*
- *Malavirechana* should be done with mild laxatives and drastic purgative should be avoided.

Virechana after proper *Snehana* and *Swedana* should be done in healthy individuals having no cardiac involvement.

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