

CORRELATION BETWEEN PROPERTIES OF MUCOSA OF RECTUM AND EFFICACY OF MATRA BASTI WITH TILL TAIL:

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ABSTRACT

Rectal route delivery is an efficient alternate to oral and parenteral route in partial avoidance to first pass metabolism. In *Ayurveda*, *panchkarma* therapy is usually carried out for *samsodhan* and *samsaman*. This therapy includes *vaman*, *virechan*, *basti*, *nasya*, *raktmokshan*. *Basti karma* includes *niruha* (*shodhan*) and *anuvasana* (*saman*). Classical literature attaches a great significance to this form of treatment. *Anuvasana basti* includes *Matra basti* in which there is use of till tail in single or medicated form. *Anuvasana basti* has no harmful effect even if staying in body. Rectum has sub mucosal fold called valves of Houston. Has no villa, epithelium layer is one cell thick, composed of cylindrical and goblet cells which secretes mucus. Absorption of drugs from epithelium involves transcellular route depends on lipophilicity. Intestinal absorption of fatty acids depends on the partition coefficient. Efficacy of *Anuvasana basti* definitely depends on its local action. For that purpose one should know the affinity of fatty acids present in till tail towards the mucus membrane of intestine. The present work is done to study the factors affecting the affinity of fatty acids with respect to structure of mucosa of intestine.

KEYWORDS: Pakwashaya, Vata dosha, Anuvasana Basti, Mucosa of rectum-1) Partition Coefficient 2) Absorption barrier, Fatty acids in White till tail.

INTRODUCTION

From the textual point of view Sushruta describes Pakwashaya (intestine) as one of the Ashaya.^[1] Pakwashaya is the seat of vata. According to Vagbhata, vitiated doshas causes diseases and their equilibrium maintain health.^[2] Vitiated doshas are treated by Shodhan (purificative measures) and shaman (rehabilitation). Shodhana (purification) includes Vaman (emesis), Virechna (purgation), Basti (enemata), Nasya (snuffing), Raktmokshan (bloodletting). This therapy is called as Panchkarma therapy in Ayurveda.^[3] According to Sushruta emesis for kaph dosha, purgation for pitta, enemata for vata dosha. The classical literature attaches a great significance to this form of treatment and points out a vivid scope of its applicability. Enemata (basti) is described as all those drugs or medicaments which are introduced through the rectum with the help of basti (animal urinary bladder).^[4] This Enemata given through the rectal route is of two types 1) Niruh (non-unctuous) and 2) Anuvasana (unctuous).^[5] Enema when properly applied stays in Pakwashaya (large intestine) and act in

the region of pelvis and all around below umbilicus. Anuvasana is so called as it is not harmful even if staying in body or as it is applied daily, it's one of the type is Matra Basti which is less in a quantity and always given without any restrictions. In modern science rectal drug delivery is an efficient alternate to oral and parenteral route of administration.^[6] Rectum has sub mucosal folds of the valves of Houston. Epithelium is one cell layer thick and contains goblet cells, which secretes mucus. Absorption of drugs in rectum depends on lipophilicity of Trans cellular cell. Sesame oil has fatty acid as major constituent.^[7] To overcome vatavyadhi use of Sesame oil for basti suggested by Acharyas. Absorption of fatty acids in rectum is dependent on partition coefficient. Correlation between mucosal absorption and properties of till (sesame oil) tail studied.

DISCUSSION

Panchakarma which is special therapy of Ayurveda lie in the core of balanced living and longevity. *Panchakarma* therapy is usually carried out with two

goals 1) *samsodhana* (biopurification) and 2) *samsaman* (rehabilitation). These procedures are applied as massage, fomentation, emesis, purgation, enemata, snuffing and bloodletting. Selection of procedure depend upon vitiated *dosha* and *prakruti* (physic). The most essential structures of the human body which act as the medium of the effect of different *Panchakarma* procedures are

- 1) *Kala* (mucosa or membrane system).
- 2) *Twacha* (skin or dermal surface).

As *tridosha* act as basic constituents of body, should be maintained in proper position with proper function by means of *Panchakarma*.^[8] As “*Vata*” is predominant factor it should always be in *samyavastha* (normalcy). *Basti* which is one of the “*Panchakarma*” applied to attain normalcy of *vata*.^[9] Classical literature attaches a great significance to this *Basti Chikitsa* and point’s out a vivid scope of its applicability. Described in *Sushruta*, *Vagbhata*, *Charaka*, those drugs or medicaments which are introduced through the rectum with the help of *basti* (with use of urinary bladder) are designated as *Bastichikitsa*.^[10] In diseased condition, *basti* cure the disease. *Basti* (enemata) when used routinely even in healthy condition in specific season, promotes physical development, complexion, strength, immunity and life span.^[11] *Anuvasana Basti* (unctuous enema) is prepared with requisite measure and properties and in quantity less than *Niruha Basti* (non-unctuous) in three quarters. *Anuvasana* is so called as it is not harmful even if staying in body or as it is applied daily. It’s one of the type is *Matra Basti* which is less in a quarter and without any restrictions. *Basti* properly applied stay in *Pakvasaya* (large intestine) pelvis, and all around below umbilicus, from large intestine. The active fraction of *basti* spreads all over the body through channels as the essence of water irrigated at the root of tree pervades the entire tree.

Modern science included enemata in type of route of drug administration specially, retention enema having treatment purpose whereas evacuation is applied as pre-diagnostic, pre operative measure. But in *Ayurveda*, *basti* play major role in both aspects treatment as well as curative. Though enema, by its force, comes back alone or with excrement, the active fraction is carried to all parts of body by various forms of *vayu*. Enema (*basti*), though situated in large intestine, draws out impurity from head feet by its power as the sun takes away sap of the earth even staying in the sky. It is choice of treatment in *Vatavyadhi* which are 60 in number.^[12] Unctuous enema should be administered after the patient has been evacuated; in this way the potency of *sneha* spreads all over the body. Thus oils, in order, which applied as in take, enema and snuff, alleviate a number of diseases. If the patient is suffering severely from *vata* alone, unctuous enema should be given to him in all the times of day and night even, if he has not undergone the evacuative measure. Unctuous enema should be known as properly administered which returns

soon with wind and faeces without causing heat and sucking pain.

Basti chikitsa is administered in rectal route but it is having impact over almost all systems. If we see the route of administration and site of action, here absorption of *basti* medication is having great importance. Rectal drug delivery is an efficient alternate to oral and parental route of administration in partial avoidance to first pass metabolism and protein drug delivery. This route allows both local and systemic therapy of drugs. In modern science, diseases like ulcerative colitis treated with application of drugs by using this route.^[13a,b] They include rapid absorption of many low molecular weight drugs.

The medicament in “*basti*” administered in “*pakwashaya*” in the quantity of 75ml.^[14] Entire Large Intestine considered as “*pakwashaya*”. But regarding *matra basti*- only a part of *pakwashaya* i.e. *malashaya* (rectum) should be taken into consideration. *Basti* (*matra*) content reaches up to the rectum when administered properly. If we go through structure of rectum, it comprises last portion of intestine 12-18 cm distally. The rectum has 2 or 3 curves within, its lumen created by sub mucosal folds called the valves of Houston. It is a hollow organ without villa. Histological the rectal wall is formed by an epithelium which is one cell layer thick and composed of cylindrical cells and goblets cells which secretes mucus. The surface area available for drug absorption in the rectum is approximately 200-400 cm. Volume of fluid in the rectum is about 1-3ml and is viscous. The rectal mileiu is constant as its pH is about 7.5-8, the temperature is usually 37⁰ c.^[15 a,b] Superior, middle and inferior rectal veins drains the rectum into the rectal vein and inferior vena cava.

Mucus Layer is providing a stable pH environment the mucus layer adjacent to the colonic mucosa acts as a diffusion barrier. It measures the movement through the colonic mucus and compared it with movement through synthetic gels and the unstirred layer. They found no difference in the movement through mucus at different sites in the colon the movement was only 50% of that through the unstirred layer and equivalent to its movement through an area. Mucus production in the colon is a function of goblet cells. Absorption of drugs from rectal epithelium involves into two transport routes the Tran’s cellular route and paracellular route. An uptake mechanism in Tran’s cellular route depends on lipophilicity where paracellular route in drug diffusion through a space between epithelial cells. There are many reports about the enhancing action of fatty acids on rectal absorption. Medium chain fatty acids showed the most effective action as absorption promoting. It has been reported that the enhancing action of fatty acids is dependent on the partition coefficient. The optimal partition coefficient was calculated at log p=4.2. This apparent correlation with partition coefficient indicates

that the uptake of fatty acids into rectal tissue must be a key factor in their potency as absorption promoting adjuvant.^[16]

If we go through the constituents of *till tail* (sesame oil), we found moisture and oil content as follows:^[17]
Sesamum Indicum(Gingelly Seed):

Constituents of Seeds	Moisture	Oil
Black Till	2 % - 5.2%	44.6% - 56.9%
Red Till	-	45.7% -55.5%
White Till	2 % - 4.4%	44.9% - 58.2%

Part of Sesamum Indicum	Contents
Seeds	Proteids 22%, Carbohydrates 18%, Mucilage 4%, Ash 4.8%, Wood fiber 4%.
Oils	70% of liquid fats consisting of the glycerides of oleic acids and linoleic acids. 12-14 % of solid fats. Stearin, palmitin and myristin. A crystalline substance sesamin and a phenol compound sesamol.

While introducing basti, medicament come in contact with mucosa of rectum. It has to act by two ways, by acting locally and also at distinct place. Most important content of till tail is fatty acid for which rectal mucosa is greatly permeable. *Ayurveda* describes importance of "basti" not only in *pakwashayagat vatavyadhi*, but also distant area diseases. *Pakwashaya* is the chief location, where vitiated *vata* occupy various sites also at the distant place causing widespread diseases of *vata*. *Acharya Charaka* numerated about 60 *vatavyadhi* predominantly caused by vitiated *vayu*. Though there are several sites of *vata* like *kati*, *sakthi* etc., *pakwashaya* is the main. To overcome *vataj vyadhi*, there is necessity to suppress or expel aggravated *vata* from its original site i.e. *pakwashaya* as well as action desired at the site of disease.

Ayurveda assume characteristics of till tail i.e. *snigdha*, *ropak*, *vataghna* etc. suppressing *vata*.^[18] How the *sneha* in till tail spread all over the body along with local action? By studying absorption related properties according to modern science, one can assume that absorption of *till tail* (oil) to desired extent is responsible for cure of *vatavyadhi*.

CONCLUSION

Till tail while introducing into the rectum through '*bastichikitsa*', also act on distinct part along with local action. *Ayurveda* mentioned that *ushna- snigdh - vataghna* etc. characteristics of *till tail* (oil) suppresses *Vayu*. But when we correlate content of *till tail* (oil) and properties like partition coefficient, paracellular permeability of mucosa of rectum, one can assume that fatty acid chain in till tail (oil) responsible for rectal mucosal absorption potency. That's why, while applying into the rectum, *basti* can act on *Vatavyadhis* located in different areas of body very efficiently.

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