

## SHODHANA CHIKITSA IN COMPARISON WITH STRESS PHYSIOLOGY - A BIOMEDICAL VIEW

Dinesh K. S.

Deepti Nair<sup>1</sup>

Smitha K. K.<sup>2</sup>

Vaidyaratnam P. S. Varier Ayurveda College, Kottakkal, Kerala, India

<sup>1</sup>Ahalya Ayurveda Medical College, Palakkad, Kerala, India

<sup>2</sup>P. S. M. College of Dental sciences and Research, Akkikkavu, Thrissur, Kerala, India

### ABSTRACT

The *Shodhana Chikitsa*, otherwise popularly known as *Panchakarma Chikitsa*, has gained much momentum in the past decades. Unfortunately, in spite of its evident therapeutic benefits the changes they stimulate when administered into the human body to bring about the disease cure is hitherto unexplored by biomedical principles. Deeper analysis of the therapeutic action guides to a hypothesis relating to Stress coping mechanism of the body's physiology. Probably, it may be said, these therapies exhibit their action by stimulating a kind of eustress into the body physiology driving into force the body's controlling and working systems to work in favour of re-establishing the lost homeostasis, i.e, the state of health. The article specifically highlights *Snehapaana* in the light of metabolic eustress, *Swedana* as thermal eustress and other purification processes (*Vamana*, *Virechana* and *Vasti*) as eustress by fluid imbalance. Whenever *Shodhana Chikitsa* produces *Atiyoga*, the condition can be termed as medically alarming type of stress and can't be considered as therapeutics.

**Keywords:** *Shodhana Chikitsa*, *Panchakarma*, Eustress, Homeostasis

### INTRODUCTION

*Shodhana Chikitsa* is one of the several the hard cores of the *Ayurvedic* therapeutics. This unique concept of the *Ayurvedic* medical science offers a viable alternative for the management of several ailments now a day. This has to be applicable with contemporary understanding in newly emerging ailments too at deeper community levels both locally and globally. Not only the classical references but also the clinical experiences support the fact that diseases once cured by administering these therapies show minimal or no recurrence at all<sup>1</sup>. Despite of this fact, to explain the probable mode of action of these therapeutic

modalities in terms of biomedical science is a challenging task<sup>2</sup>. This paper is an attempt to analyze a possible mode of action of these *Panchakarma* therapies in terms of Biomedical principles.

#### ***Shodhana chikitsa vis-a-vis homoeostasis and eustress***

The classical principle of *Shodhana Chikitsa* (SC) is that these purificatory procedures eliminates out the morbid *Doshas* which are causing the disease and thereby restores the equilibrium of *Tridoshas* defining the state of health. But virtually, it can be said that these procedures are aimed at preparing the body to get its own corrective mechanisms stimulated so as to effectively

respond to the existing crisis and thus to speed up the healing. The stimulation is provided through SC in the form of a hitherto inexperienced and unexpected intervention into the normal physiological equation of the living body. For appreciation of this, a better understanding of the basic principles of physiology is inevitable. Accordingly, the normal Cell health and functioning is maintained by a state of Homeostasis in the internal milieu of the body, i.e., the Milieu intérieur popularly known as the ECF of the body<sup>3</sup>. The state of homeostasis is measured in terms of pH, osmolarity, nutrients concentration, oxygen concentration, waste removal from ECF. This homeostasis is maintained by the co-ordinate functioning of the physiological systems of the body, broadly grouped under two-Working systems and the Controlling systems<sup>4</sup>. Respiratory, digestive, circulatory and excretory systems are the working systems whereas the Nervous and the endocrine system are the controlling systems of the body. An analysis of the broad spectrum indications of the SC reveal the fact that these are beyond the restrictions of the physiological systems and, so, can generally be administered uniformly irrespective of the system involved. Further, the detailed description of the procedure along with the discussion on adequate (*Samyak yoga*), insufficient (*Ayoga*) and excessive execution (*Atiyoga*) highlights the caution required while administering these procedures, which warns of the fact that these procedures are violating the normal physiological function. This means, such a controlled disturbance in the physiological systems can regulate the entire. Relating this understanding to the modern physiology, it seems that this effect may be

achieved through the ECF since it is the only material which is constantly flowing keeping in direct contact with all the systems of the body and thus it is the only medium which can be manipulated to bring about changes in these physiological systems. This principle is made use of in the *Shodhana Chikitsa* procedures.

This concept can be elaborated under the purview of Stress which is defined as a physiological reaction by an organism to an uncomfortable or unfamiliar physical or psychological stimulus. This stress is of two kinds – Eustress and Distress<sup>5</sup>. The one whose outcome is a negative response is called Distress whereas the one capable of generating a positive beneficial response is called as Eustress. To be more precise, SC is a sort of Eustress which alerts the body's corrective mechanisms by stimulating the controlling systems of the body, thereby, exhibiting their influence through the working systems of the body to achieve a normal homeostasis i.e., the state of normal cell health.

#### **Pre-purificatory Oleation**

In *Snehana*, the patient is sustained on a fat rich diet while maintaining a glucose-deprived state. But the normal physiology of the body is accustomed to the glucose metabolism alone for its basic energy needs. Thus *Snehanapana* is actually creating a fat metabolic challenge preceded by a glucose metabolic challenge. Such a metabolic challenge is identified as a eustress and which, in turn stimulates the two major controlling systems of the body. As an output of this stimulation the hormonal secretions are increased especially those of Adrenaline and Cortisol which initiate an Immune suppressor and anti inflammatory responses through

the working systems<sup>6</sup>. The dose of *Shodhanapoortvaka Snehapana* is decided considering the digestive capacity (*Agni*) of the individual or in other terms the time taken to digest a particular amount of *Sneha* (fat preparations). The body absorbs and metabolizes the maximum amount of fat required to support the physiological functions during this gluco-deprived state while the excess is eliminated out, explaining the elimination of fat with faeces during the administration of higher doses of *Sneha* during the latter days of *Snehapana* (SP). Thus, the aim of SP may be to create a Eustress in the form of a metabolic challenge at the physiological level which alerts the body's mechanism to fight against the crisis and re-establish the homeostasis.

#### Pre-purificatory sudation

*Swedana* or sweating is a response of the body achieved by creating a thermal challenge by manipulating the factors of thermal comfort which are defined in terms of air temperature, air velocity, air humidity, mean radiant heat, metabolism and insulation<sup>7</sup>. The safe limit of these factors determines the zone of thermal comfort for an individual. Thus, the methods of inducing sweating (*Swedana*) mentioned in the ayurvedic literatures are different manipulations of the factors of thermal comfort, for example, *Jenthaka sweda* and *Karshu sweda* are manipulations of the air temperature in a closed room; *Nadeesweda*, *Valukasweda* of air humidity; *Taila pariseka*, *Kwathaparisheka* by manipulating radiant heat; *Anagneya Sweda* like *Gurupravarana* by the method of insulation; *Vyayaama*, *Bhaya*, *Ahava*, *Krodha*, *Bhuripana*, *Kshut* manipulating the metabolic rate and in general the indication for *Swedana* in *Niva-*

*tagraha* is a manipulation of air velocity. Precisely, the aim of such *Swedana* procedures is to conduct the heat from a source to the human body using a heat conductor. The different types of *Swedana* explained are the different modes of transferring variable degrees of heat energy as per the required condition based on the calorific value of the heat conductor involved there whether it is *Kashaya* (decoction), *Taila* (oil), *Churna* (powder of drugs), *Patra* (leaves), *Shahtika panda* (rice bolus) etc. Accordingly different degrees of *Swedana* are attained in different *Doshik* predominances, as mentioned *Upannah Sweda* (applying as warm poultice) in *Vata*, *Drava Sweda* (applying heat through liquids) in *Pitta* and *Tapa Sweda* (applying heat through touch of heated materials) and *Ushma Sweda* (applying heat through steam) in *Kapha*. A thermal eustress thus created calls for the body's corrective mechanism to come into play, chiefly by the stimulation of the autonomic nervous system; one of the most important among these being the decrease in the cardiac output<sup>8</sup>. In response to this the medullary Cardio-Vascular control centre brings about peripheral vaso-constriction and increased central circulation which helps to restore the normal cardiac output thereby improving the circulation to the affected areas promoting healing<sup>9</sup>.

#### Emesis, Purgation and Purificatory enema

In a *Vamana* (emesis) or a *Virechana* (purgation) or a *Sodhana Vasti* (purificatory enema), a state of mild fluid loss - Hypo hydration- is created in the body by the loss of body fluid including water, electrolyte, proteins, and metabolic wastes. While in *Vamana* and *Virechana* this hypohydration is stimulated by administering a strong emetic

or purgative which drives out the intracellular fluid into the GIT, in *Vasti* this is attained by administering a hypertonic solution into the rectum which extracts out the intracellular fluid from lower GIT. This is a physiological Eustress which send signals to the Para Ventricular Nuclei of hypothalamus which in turn stimulates the secretion of hormones like Corticotropin Releasing Hormone (CRH) and Arginine Vasopressin. These hormones activate the hypophyseal portal system subsequently activating ceruleus/nor adrenergic (LC/NE) system. At the end of this chain of responses the ANS and the Neuroendocrine responses are stimulated<sup>10</sup>. These being the controlling systems of the body, their stimulation help to restore the normal physiological functioning of the other working systems thereby enhancing the process of healing. By creating a hypohydration in the ECF, which triggers the response in the Controlling systems of the body thermoregulatory, endocrine, plasma, GI tract, Cardiovascular, and metabolic stimulation can be established thereby re establishing the lost state of cell health<sup>11</sup>. For example, the hyperosmotic internal environment created by hypohydration reduces the evaporative heat loss by reducing the activity of medial pre-optic warm-sensitive neurons of hypothalamus (thermo regulatory response of hypohydration). As discussed above; hypohydration stimulates ADH secretion increasing the overall cardiac output (cardiovascular response of hypohydration). Briefly, by inducing a *Vamana* or a *Virechana* in the GI tract or by administering a *Vasti* the stimulus can be transmitted through the ECF even for healing an ulcer at the tip of the finger or the toe; or to cure any psychiatric disorders; or even to manage a

condition like cystic fibrosis. Thus, by inducing a Eustress through the ECF the body's corrective mechanism can be recruited to heal a crisis anywhere in the body. This explains the broad spectrum of diseases enlisted as the indications of such treatment modalities.

However, while manipulating the body systems in the above mentioned therapies, the important thing is to note when and where to stop the procedures so as to prevent complications by flaring up the pathology or triggering pathology anew. For this demarcation, textual references are available about the *Samyak Lakshanas* (signs of adequate therapy) and *Atiyoga Lakshanas* (signs of excessively executed therapy) of these therapies. The *Snehavyapat Lakshanas* (complications due to inappropriate oleation) co-relate well with the pathological symptoms of improper fat digestion in the gut and transportation precipitated due to the factors interfering with fat digestion and transportation like larger doses (*Atimatra*) or non-observance of dietetic restrictions (*Mithya ahaara*). Similarly, the symptoms of *Sweda vyapat* (complications due to inappropriate sudation) like *Trishna* (morbid thirst), *Moorcha* (fainting), *Amgasada* (weakness of body), *Bhrama* (giddiness) etc coincide with the pathological symptoms of electrolyte imbalance induced during conditions like heat stroke leading to excessive sweating. To prevent this pathology the physician can make use of scales of thermal comfort like Skin wettedness, Fighter Index of Thermal Stress (FITS), Effective Heat Strain Index (EHSI), Predicted Sweat Loss, Physiological Strain Index (PSI), Modified Discomfort Index (MDI), Environmental stress index

(ESI), etc. based on the objective assessment for thermal discomfort<sup>12</sup>.

Likewise, the *Samyak Lakshanas* of *Vamana*, *Virechana* and *vasti* also guide about the physiological limit of the state of hypohydration. The symptom morbid thirst (*Trishana*) discussed under the *Vyapat Lakshanas* of these therapies, is an identified first sign of dehydration. The thirst centre in the hypothalamus is stimulated only when there is a Na<sup>+</sup> ion concentration exceeding a minimum of 2mE/L above the normal which results only from excessive fluid loss from the body. Thus, the perfect delineation between the *Samyak* and *Atiyoga Lakshanas* highlight the fact that these therapies are aimed at making manipulations in the physiological systems only within the safe limit.

## DISCUSSION

SC is a pivotal therapeutic measure in Ayurveda for several diseases. These are practiced by several physicians globally as a complimentary or alternative procedure. Bio medical explanation of the effects of the SC is needed for the scientific acceptability and understanding. Application of stress physiology is one among several tools to explain the effects of SC. *Snehana* and *Swedana* are procedures in which a metabolic and thermal Eustress is being introduced in to the human system by using high dose of fat and heat respectively. All other SC are different routes and form of eustress of hypovolaemia induced by water or blood loss.

## CONCLUSION

Thus, it is evident that an analysis of the SC is incomplete without the discussions of the concepts of Eustress and Hypohydration. So SC has been evaluated on the biomedical aspects of these two phenomenons – Eustress and Hypohydration. But, the sub-

ject not being of much practical relevance to the bio-medicos, the textual and research references regarding the concept of Hypohydration are very few. A better understanding about this subject is, however, available in sports medicines with sufficient evidence based research works. As Nasya is a local Shodhana Chikitsa the concepts of bio medical science may not be applicable to the fullest extent. Thus, the principles of SC formulated centuries ago, though may seem to be an inexplicable miracle, but are equally scientific as any other present day medical therapy. Any phenomenon in this universe holds behind it a definite scientific reasoning. Even the SC is not an exception to this.

## REFERENCES

1. Vagbhatta. Astanga Hridayam. Srikantha Murthy KR ,Translator. 8<sup>th</sup> edition. Varanasi: Chowkhamba Krishnadas Academy; 2011, Vol 1, 4/ 26, pg 50
2. Roy Chaudhary R, Thatte U, Liu J.Clinical Trial Methodology.In Traditional Complimentary and Alternative Medicine:Policy and Public Health Perspectives.Ed Bodeker G & Burfrd G. Oxford University, UK.2007.389-40
3. Guyton A.C., Hall J.E. Lipid Metabolism. Textbook of Medical Physiology. 11<sup>th</sup> Edition. India: Elsevier; 2008, 4
4. Anil Baran Singha Mahapatra, Essentials of Medical Physiology. Revised Edn.,2000, Current Books International, India,15
5. Selye. Confusion and Controversy in the stress field. Journal of Human Stress. 1975. 1, 37-44.
6. Guyton A.C., Hall J.E. Lipid Metabolism. Textbook of Medical Physiology. 11<sup>th</sup> Edition. India: Elsevier; 2008, 362
7. Fanger P O, Thermal Comfort, Danish Technical Press, Copenhgen,1970,21-23

8. Shinji Yamamoto et al. Evaluation of the effect of heat exposure on autonomic nervous system by heart rate variability and urinary catecholamines. J Occup Health, 2007, 49: 100-204
  9. Sollers JJ, Sanford TA, et al. Examining changes in HRV in response to varying ambient temperature. IEEE Eng Med Bio Mag , 2002, 21,30-34
  10. Tsigos et.al. Hypothalamic-Pituitary-Adrenal axis, Neuro-endocrine factors and stress,Jour.of Psychosomatic Research, 2002,53, 865-871
  11. Murray R, Fluid needs in hot and cold environments, Int J Sports Nutr, 1995, 5:S62-S73
  12. Yoram Epstein, Daniel S Moran. Thermal comfort and the heat stress indices, Industrial health, 2006, 44, 388-398
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#### CORRESPONDING AUTHOR

Dr. Dinesh K. S.

Vaidyaratnam P. S. Varier Ayurveda College, Kottakkal, Malappuram Dt, Kerala, India. Pin- 676501  
Email: drayurksd@gmail.com

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