

CRITICAL REVIEW OF EFFICACY OF PANCHAKARMA IN PREVENTING DISEASES THROUGH THE WAY OF IMMUNITY (STRESS RESPONSE HORMESIS)

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ABSTRACT

Panchakarma has *Samshodhana* as a main objective. Four out of five procedures expel the humours for purificatory purpose. Though all the procedures are different in methods, they are tied in one bunch. It indicates they are something very common among them. It probably is the nature of their action. *Panchakarma* procedures are *Apakarshana* (scrapping) in nature. They are quite stressful in nature. They create a lot of stress over the metabolism during their course. Any type of stress over the body invokes immunity response from the body. This immunity work is carried out through the ways of endocrinal secretions, lymphocyte mobilisation or response to inflammation created by the stress. So there are a lot of chances that *Panchakarma* procedures might be stimulating the immunity system to reduce the ailments by producing a lot of antistress metabolites in the blood stream. This can be understood if studied the “Stress Response Hormesis”.

Keywords: *Panchakarma, Samshodhana, immunity*

INTRODUCTION

“*Panchakarma*” is the special term used by Charaka which includes five specialised procedures viz *Vamana* (Act of Vomiting), *Virechana* (Act of purgation), *Niruha Basti - Anuvasana Basti* (Acts of medicated enema) and *Nasya* (Act of medicated nasal instillation). In medical sciences, there is an established pattern of treatment. The whole part of treatment is divided in two broad categories viz Medicines and Surgery. Diseases are cured by giving medicines or correcting by surgical intervention. *Panchakarma* is the way of curing the ailment in a slightly dif-

ferent manner. It definitely does not fall in the category of Surgery. It is not the medicinal way of treating the diseases too. So it definitely holds some different way of action over all the systems.

Role of *Panchakarma* in prevention of Diseases -

A. Role in preventing the diseases already cured -

“The treatment modules like *Langhana-Pachana-Rukshana-Stambhana* etc. though might be helping to pacify provoked humours and decrease the quantity of

humors significantly, they are not that much effective as that of *Panchakarma*. Former modules of treatment as explained above may be helpful in decreasing the diseases by passifying the humors, but the residual humors after the treatment may get provoked immediately if they got the boost from the similar properties to them gained from causative factors. But the humours if passified or removed by *Panchakarma* may not get provoked with same strength again.¹The disease passified by the treatment of *Panchakarma* becomes 'Apunarbhava' means it will never occur again once cured by *Panchakarma* treatment²".

B. Role in prevention of the diseases -

"If one pursues *Vishamaswasthavrutta*, it will create diseases and if one follows *swasthavrutta*, one will enjoy *Aroga*. So everybody shall pursue *swasthavrutta* to be fit and to stay healthy³. In the months of *Chaitra-Shravana-Margashirsha*, respective humors like accumulated *Kapha-Vata* and *Pittas* shall be expelled from the body by appropriate procedures. After obtaining proper Oleation- Sudation, one must remove humors from upper and lower routes of the body (i.e. *Vamana* and *virechana*). Following that one should perform *Basti* and *Nasya*. This must be followed in an appropriate way and in appropriate sequence. The person who knows the management is according to 'time' must use approved medicines from *Rasayana* and *Vrushya* categories⁴.

"The person who follows the above cited process will never get affected by the diseases. One's Dhatus will stay in normal levels qualitatively as well as quantitatively. Dhatus will be strengthened and the person will be able to delay the process of age-

ing. This system of treatments is explained to prevent the *Nija* diseases from occurrence⁵.

Panchakarma acts in both the ways that it prevents the diseases to arise in future as well as the diseases which once get cleared shall not appear again too. This function mimics to that of vaccines. "A vaccine" is a biological preparation that provides active acquired immunity to particular disease. It stimulates the body's immune system to recognize the agent as a threat, destroy it, and keep a record of it, so that the immune system can more easily recognize and destroy any of these microorganisms that it later encounters. Thus, *Panchakarma* might be working on the lines of Immunity over the whole body⁶. One must try to understand the hypothesis on the basis of five logical steps which lead to establish a 'Sidhanta (Principle)' viz. *Pratidnya-Hetu-Udधारana-Upanaya-Nigamana* as follows.

Aims and Objectives (PRATIDNYA):

1. To study the nature of action of *Panchakarma* over the body.
2. To study the effect of stress over the immunity and overall physiology of the body.
3. To study the beneficial effect of stress through the produres of *Panchakarma* over the body.
4. To establish the process of "Stress Effect Hormesis" through *Panchakarma*.

Materials:

1. Literary review of various definitions, nature, indications and effects of *Panchakarma*.
2. Literary review of stress Response hormesis, physiology of immunity, published experiments done to evaluate the effects of stress over the body.

Methods:

1. Role of *Panchakarma* in prevention of the diseases were studied.
2. Collection and analysis of all the references were done.
3. The collected data of references was compared and processed logically to verify the concept and to arrive at conclusion.

OBSERVATIONS:

HETU -Logical thought behind the Hypothesis - Effect of *Panchakarma* over physiology - *Panchakarma* procedures need strength of the body to face the removal of provoked and quantitatively huge Humours from the body. They are done with caution after excluding all the burdening pathologies which might put stress over the body. If done excessively, they might create harm or it is said they are bound to create complications if anyone of the doctor-Medicines-Patient and Nurse performs a mistake⁷. So *Panchakarma* do definitely put stress over the body. It can be perceived from the following examples too.

1. "After removal of provoked humours and bloodletting, Vata might get aggravated immediately occupying the 'Shudha Koshta' (evacuated Gastro intestinal tract)' in a 'weakened patient (of *Kushtha*)'. So he must be supplied with enough quantity of strength (*Bala*) through the way of unctuous material⁸". So, this narration indicates that 'Shodhana (Purificatory) procedures' put "**stress over the body**" which may deplete the strength.
2. Four out five processes are included in 'ten types of *Langhana* (Fasting) way of treatment (*Chatushprakara Samshudhi*)⁹.' *Langhana* brings lightness to the body tissues¹⁰. This will not happen

without excreting extra or excess humours are removed from the metabolic system. So *Langhana* basically improved excretion by fastening catabolism.

3. These procedures create "*kshobha*" inside the physiology of the body¹¹. There is a lot of turbulence inside the body whenever these procedures take place inside the body. They definitely influence the physiology. These processes put a lot of stress over the normal mechanism. Throwing away the humours is the apparent thing. But at the backdrop of these procedures, metabolic rate gets increased. Increase in blood pressure, pulse, temperature during the process of *Vamana* is the indication of the turnover of the metabolites taking place during the processes.
4. Even during explaining the treatment after shodhana especially by Virechana in "*Chikitsa prabhritiya*", the expression is used for the effects over the body in the words as "*Bheshaja Kshapite*"¹². So the effects after using the *Samshodhana* medicines over body are considered "weakening" of the body. In the present context - Just like weakening of provoked humors, as a result of *Samshodhana*; weakening of *Dhatu*s also takes place¹³.

So during *shodhana*, along with provoked humours, there is a loss of *Dhatu*s too. It results ultimately in weakening of the patient for some time. It is not automatically corrected and needs further attention of the physician. The weakened body of the patient is further replenished with the "Pathyakara Ahara, the food articles like Ghee-mutton soup-

milk-soup of lentils along with food which will be good to heart. All these food articles must be of *Brumhana* properties. This treatment is accompanied by Gentle body massage with oils-pastes, bathe – *Anuvasana* and *Niruha Basti*. All these treatments will provide good health and longevity to the person¹⁴.”

5. It is precisely made clear while stressing the importance of *Snehana* and *Swedana* before *Panchakarma*. Both *Snehana* and *Swedana* are useful in preventing aggravated Vata which ultimately is increased due to “irritation or turmoil or turbulence caused by *Panchakarma*.¹⁵” The said citation proves that *Panchakarma* procedures ‘put stress over the physiology’ and by compelling body to remove the stagnant material - which already has become burden fo the body.
6. It is advised to keep a gap of seven days in both the treatments viz. *Virechana* and *Basti*. One shall not administer *basti* after finishing the complete procedure of *Virechana*. He also claims in reverse too that one shall not be allowed to undergo *Virechana* process before seven days after completion of *Basti* treatment as these processes do ‘Injury or Harm to the body¹⁶. *Chakrapani* clarifies the term ‘Vikaset’ as Vikaset iti Himsayam¹⁷. . “*Himsayam*“ literally means ‘**violence or physical injury to the body.**¹⁸
7. The word “*Vikas*” is made from two roots “*Vi + Kas*.” The root ‘*Vi*’ is used in a lot of ways¹⁹. It sometimes intensifies that idea. So, the word ‘*Vi-kas*’ means to burst, become split or divided. So the process makes the split divide bursts intensively.²⁰

From above inferences it must be understood that *Panchakarma* creates stress over the body. Strenuous procedures like *Samshodhana* treatments involve all the cells and channels inside the body and make them ready to expel the provoked humors from the system by the nearest route as possible.

Role of stress in Human physiology²¹ –

Stress can have many profound effects on the human biological systems. Biology primarily attempts to explain major concepts of stress using a stimulus-response paradigm, broadly comparable to how a psychobiological sensory system operates.

When a stressor acts upon the body, the endocrine system is triggered by the release of the neurotransmitter noradrenalin by the autonomic nervous system. Noradrenalin stimulates the hypothalamic-pituitary-adrenal axis (HPA) which processes the information about the stressor in the hypothalamus. This quickly signals the pituitary gland and finally triggers the adrenal cortex. The adrenal cortex responds by signaling the release of the corticosteroids cortisol and corticotropin releasing hormone (CRH) directly into the bloodstream. During an alarming situation in which a threat is detected and signalled to the hypothalamus from primary sensory and limbic structures, cortisol is one way the brain instructs the body to attempt to regain homeostasis – by redistributing energy (glucose) to areas of the body that need it most, that is, toward critical organs (Heart & Brain) and away from digestive and reproductive organs, during a potentially harmful situation in an attempt to overcome the challenge at hand.

Hormesis -

This whole phenomenon may be called as “Stress response Hormesis. Hormesis refers to the beneficial effects of a treatment that at a higher intensity is harmful. In one form of hormesis, sub lethal exposure to stressors induces a response that results in stress resistance. The principle of stress-response hormesis is increasingly finding application in studies of aging, where hormetic increases in life span have been seen in several animal models²². The principle of “*Stress-response hormesis*” can be seen in action in many contexts.

E.g. Low levels of insecticides can induce chemical resistance by increasing xenobiotic detoxification (Calabrese et al., 1999). Or induction of drug metabolizing enzymes by xenobiotic chemicals can provide protection against carcinogenesis (so-called chemoprotection) (Talalay et al., 2003)

UDAHARANA (Example to prove the hypothesis)–

An experiment²³ was performed on rats, in which they were subjected to mild stress by confining them (gently, and with full ventilation) in transparent Plexiglas enclosures to induce stress. Blood was drawn several times over a two-hour period and, for each time point, measured levels of three major hormones — nor epinephrine, epinephrine and corticosterone (the rat analog of cortisol in humans) — as well as of several distinct immune-cell types in the blood. It caused a massive mobilization of several key types of immune cells into the bloodstream and then onto destinations including the skin and other tissues. This large-scale migration of immune cells, which took place over a time course of two hours, was comparable to the mustering of troops in a crisis. Similar im-

mune-cell redistribution in patients experiencing the short-term stress of surgery predicts enhanced postoperative recovery.

UPANAYA:

Action of Shodhana through stress mechanism - *Samshodhana* treatments have the nature of “*Apakarshana*.” The word ‘*Apakarshana*’ has the meanings²⁴ (MW 48) like forcing away, removing-diminshing-dragging down and abolishing. Even the word “*Karshana*” in it, is having the meanings²⁵ (M W 260) like pulling to and fro, dragging, tormenting, vexing, pulling off, triggling, hurting, injuring, ploughing.

During any type of *Samshodhana*, when one administers a large amount of decoction of medicines inside the gastrointestinal lumen, it causes irritation in the mucous membrane of GIT. During the forceful removal of accumulated humours repeatedly for evacuation, it scraps the mucosal layer over the gastric mucosal surface. This stimulates a series of several steps by the defense mechanism of the body, to protect, further damage, through the means of inflammation.

These types of changes may compel cortisol to be secreted in large amounts during the process of any type of *Samshodhana*. Actually cortisol is secreting to achieve immediate effect of blocking most of the factors that are prompting the inflammation. But in addition the rate of healing is enhanced. This probably results from the same, mainly the undefined factors that allow the body to resist many other types of physical stress when large quantities of cortisol are secreted.²⁶ Thus, by this path *Samshodhana* procedures might be helping to root out many ailments with the complex pathogenesis. Following is one of the examples to comprehend the action of *Samshodhana*.

Kushtha (Skin disorders): In the modern medicine, cortisol has been used mostly for topical application for a longer period and for systemic use upto shorter time in the cases of skin disorders. Cortisol is helpful but needs a longer duration in chronic cases. So, one dose of steroid or secretions of the same for only shorter tenure are not sufficient. So, *Vamana* must have been suggested after every 15 days, *Virechana* after every 1 month, *Nasya* for every 3 days and *Raktamokshana* once in six months in the treatment of *Kushtha*.²⁷ Thus, an extra cortisol secreted through single procedure may not provide the sufficient amount of cortisol. Hence repeated purifications are suggested so that the body will get enough doses within shorter period. Body will fulfill the needs of remedy from time to time.

DISCUSSION

The working pattern of *Samshodhana* is just like this only. Immunity starts working hard when any stress is apparent over the body or any open threat to the body. Immediately it starts producing very strong metabolites in the form of WBCs – Lymphocytes – Monocytes- Tcells-Bcells-Helper cells etc. So it will not be so untrue to claim that *Panchakarma* might be working slightly on the terms of the ‘system of Immunity.’ *Panchakarma* might be yielding its effects by creating physical stress to the body and igniting defence response by challenging the immunity to fight against it (The process of “Stress Response Hormesis”).

CONCLUSIONS

1. *Samshodhana* procedures need strength of the body i.e. *BALA* to perform

them. Weak patients (*DURBALA*) cannot bear them.

2. They purify the body by improving or fastening the catabolism of the body.
3. They create physical insult or injury to the body which ultimately challenge the immune system to react and fight the attack. Thus “awakening the body immunity” might be the way of proving its efficacy.
4. Thus procedures in *Panchakarma* work in the similar way of ‘Stress Effect Hormesis’.
5. These processes must be boosting immunity through putting stress over the physiology in the body.

REFERENCES

1. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi. Choukhamba Prakashan; 1994. Sutrasthana 16/20, 21.
2. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi. Choukhamba Prakashan; 1994. Sutrasthana 16/20, 21.
3. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi. Choukhamba Prakashan; 1994. Sutrasthana 7/ 45.
4. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi. Choukhamba Prakashan; 1994. Sutrasthana 7/46-48.
5. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi. Choukhamba Prakashan; 1994. Sutrasthana 7/ 49, 50.
6. www.Wikipedia.com
7. Charka. Charaka Samhita, Yadavaji Trikamji, editor. 1st ed. Varanasi.

- si.Choukhamba Prakashan; 1994.Sidhisthana 6/.....
8. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Chikitsasthana 7/ 42.
9. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994.Sutrasthana 22/ .
10. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sutrasthana 22/.
11. Chakrapanidatta.Ayurveda Dipika Commentary on Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sutrasthana 2/15.
12. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994.Sutrasthana 16/22.
13. Chakrapanidatta.Ayurveda Dipika Commentary on Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sutrasthana 16 / 22.
14. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994.Sutrasthana 16/ 23.
15. Chakrapanidatta.Ayurveda Dipika Commentary on Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sutrasthana 2/15.
16. Charka. Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sidhisthana 1/ 26.
17. Chakrapanidatta.Ayurveda Dipika Commentary on Charaka Samhita, Yadavaji Trikamji, editor.1st ed. Varanasi.Choukhamba Prakashan; 1994. Sidhisthana 1/26.
18. M.Monier Williams. Sanskrit English Dictionary, Prof E. Leumann, Prof C.Cappeller, editors. Corrected ed. Delhi. Motilal Banarasidas publishers; 2002. P. 1297
19. M.Monier Williams. Sanskrit English Dictionary, Prof E. Leumann, Prof C.Cappeller, editors. Corrected ed. Delhi. Motilal Banarasidas publishers; 2002. P. 949.
20. M.Monier Williams. Sanskrit English Dictionary, Prof E. Leumann, Prof C.Cappeller, editors. Corrected ed. Delhi. Motilal Banarasidas publishers; 2002. P.954.
21. www.Wikipedia.com.
22. David Gems and Linda Partridge, Institute of Healthy Ageing and Department of Genetics, Environment and Evolution, University College London, London WC1E 6BT, UK. Correspondence: l.partridge@ucl.ac.uk.
23. Firdaus Dhabhar, PhD, an associate professor of psychiatry and behavioral sciences and a member of the Stanford Institute for Immunity, Transplantation and Infection. <http://med.stanford.edu/news/all-news/2012/06/study-explains-how-stress-can-boost-immune-system.html>.
24. M.Monier Williams. Sanskrit English Dictionary, Prof E. Leumann, Prof C.Cappeller, editors. Corrected ed. Delhi. Motilal Banarasidas publishers; 2002. P. 48.

25. M.Monier Williams. Sanskrit English Dictionary, Prof E. Leumann, Prof C.Cappeller, editors. Corrected ed. Delhi. Motilal Banarasidas publishers; 2002. P.260.
26. A.C.Guyton and J.E.Hall, *Textbook of medical physiology, Prism Books PVT LTD, 9th edi.*1996. P. 963.
27. Shrimat Vagbhata. AshtangHridayam. Dr Kunte, Vd Navare, H S Paradkar, editors. 7th ed. Varanasi: Chaukhamba orientalia; 1982.Chikitsasthana.19/96.p.

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