

## Ayurveda Perspective of Management of Cancer Chemotherapy Induced Nausea and Vomiting

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### Abstract

This article offers a conceptual model from authentic Ayurveda literature that looks at Cancer Chemotherapy induced Nausea and Vomiting (CCINV) in a new light. It offers the basis to understand and manage the psychological and physiological distress by addressing the subjective concerns of the patients giving them better treatment satisfaction and quality of Life. This model extrapolates the Ayurveda concept of disturbed Jatharagni (gastric fire), the subtle energy that controls all digestive activities, to understand CCINV. The model also proposes that these disturbances can be corrected by regulation of energy channels (Vayuniyantrana) by therapies recommended in yoga and Ayurveda.

**KEYWORDS;** Cancer, Chemotherapy, Yoga, Ayurveda, Nausea.

Chemotherapy has enabled Cancer patients to live longer, but still has a high cost, in terms of adverse events and quality of life<sup>[1]</sup>. In two studies, nausea ranks number 1 as the adverse event of chemotherapy of most concern to patients, with vomiting ranking as the 3rd and the 5th most distressing symptom<sup>[2]</sup>. Advancements in antiemetic therapies have been successful in controlling vomiting but have exacerbated nausea<sup>[3]</sup>. Pathophysiology behind this chemotherapy induced nausea and emesis is fully not known. The chemotherapy trigger zone (CTZ) is located in a medullary center located in the area postrema, which is susceptible to emetic stimuli delivered through the blood or cerebrospinal fluid (CSF)<sup>[4, 5]</sup>. The chemotherapy trigger zone stimulates the vomiting center, an area of the medulla oblongata that acts by stimulating the phrenic, spinal, and visceral nerves. These efferent signals induce vomiting by their effects on the diaphragm, abdominal muscles, and stomach. The vomiting center also receives signals of increased intracranial pressure from visceral organs, the inner ear labyrinthine apparatus, and higher CNS structures. The antiemetic's act on CTZ or on the receptors on gastric mucosal lining and induce gastro paresis. Though numerous studies highlight the role of psychological distress and susceptible risk factors in modulating nausea and emesis in cancer patients, they have not been able to address this issue holistically thereby having nausea as a predictable Side effect of chemotherapy<sup>[6]</sup>. Ayurveda is an ancient Indian medical Science that lays emphasis on holistic approach to treatment of diseases by restoring the homeostatic mechanisms that confer health. Health according to Ayurveda is defined as (a) equilibrium of doshas or vital Bio factors that are responsible for metabolic processes in the body, (b) equilibrium in the thirteen Agni's that are the Bio energy/Power components responsible for functional activities of all tissue systems,

(c) health of the seven tissue systems or Dhatus, (d) proper excretion of waste products of metabolism and (e) restraint over sensory organs, a happy mind and inner peace<sup>[7]</sup>. Ayurveda emphasizes assessment and corrections of several factors that are disturbed during illhealth, dosha being the most important among them. Doshas - “doshas are the three bodily humors that make up one's constitution. *Vāta* is the impulse principle necessary to mobilize the function of the nervous system. It has five components: Prana Vata located in the brain, head, throat, heart and respiratory organs that governs inhalation, perception through the senses and the mind ; Udana Vata located in the naval, lungs and throat that governs speech, self expression, effort, enthusiasm, strength and vitality; Samana Vata located in the stomach and small intestines that governs peristaltic movement of the digestive system; Apaana Vata located between the naval and the anus that governs all downward impulses (urination, elimination, menstruation, sexual discharges etc.); Vyana Vata centered in the heart and permeates through the whole body that governs circulation, heart rhythm, locomotion. *Pitta* is the energy principle which uses bile to direct digestion and hence metabolism with heat as its chief quality. The five aspects of pitta are: Pachaka Pitta that Governs digestion of food which is broken down into nutrients and waste. Located in the lower stomach and small intestine; Ranjaka Pitta - Governs formation of red blood cells, Gives colour to blood and stools, Located in the liver, gallbladder and spleen; Alochaka Pitta - Governs visual perception. Located in the eyes; Sadhaka Pitta - Governs emotions such as contentment, memory, intelligence and digestion of thoughts. Located in the heart; Bharajaka Pitta - Governs lustre and complexion, temperature and pigmentation of the skin. Located in the skin. *Kapha* is the body fluid principle which relates to [mucus](#), lubrication, and the carrier of nutrients. the five components of kapha are: Kledaka Kapha - Governs moistening and liquefying of the food in the initial stages of digestion. Located in the upper part of the stomach; Avalambhaka Kapha - Governs lubrication of the heart and lungs. Provides strength to the back, chest and heart. Located in the chest, heart and lungs; Tarpaka Kapha - Governs calmness, happiness and stability. Nourishment of sense and motor organs. Located in the head, sinuses and cerebrospinal fluid. Bodhaka Kapha - Governs perception of taste, lubricating and moistening of food. Located in the tongue, mouth and throat; Shleshaka Kapha - Governs lubrication of all joints. Located in the joints”<sup>[8]</sup>

Agni-Food consumed will not provide good health unless it is digested properly. The digestion of food is carried out in the stomach (*jathar*) by the subtle bioenergy which is referred to as “digestive fire” (*jatharagni*).<sup>[9]</sup> There are thirteen types of fire that operate in the body which are responsible for various metabolic activities<sup>[10]</sup>; these include the master Agni in the stomach, the jaatharagni, seven *dhatu Agnis* which are responsible for the formation of tissues (*dhatu*), and five *bhuta Agnis* that integrate the five elements (*panchmahabhutas, the earth, water, air, fire and space*). These *Agnis* are descriptive categories that are responsible for carrying out the action of different enzymes and metabolic processes. Of the thirteen types of Agnis, the most important is the digestive fire/jatharagni, the collective subtle energy that encompasses the entire process of digestion. The concept of the digestive fire (*jatharagni*) is significant due to its central role in the digestive processes such as formation of nutritive fluid (*ahara rasa*), the physiological elements (*doshas*), tissues (*dhatu*), and wastes (*malas*).<sup>[11, 12, 13, 14, and 15]</sup>

Ama-When the agni becomes weak (*mandagni*), a number of unwanted unripe byproducts of digestion and metabolism start forming and accumulating in the body at

different levels from the gross to the molecular level, from a local gastrointestinal tract (GIT) level to the systemic level in tissues and cells. Such products are collectively called ama and act as toxic and antigenic materials. The systemic signs and symptoms of the ama state are slow digestion, heaviness in the body, lack of appetite, nausea, salivation, distaste, constipation, heaviness in the belly, lethargy etc. Aama is a kind of autotoxin and acts like a foreign body or antigen in the body to which the body reacts immunologically, releasing nonspecific antibodies in the system. The presence of ama renders an ama state (amavastha) in the body, which is characterised by increasing impermeability and sluggishness of the body channels or srotas resulting in srotodusti.<sup>[16]</sup>

Srotasas -For normal functioning of the body, it is essential that these channels (srotas), both the gross and subtle, remain intact and do not get blocked. Diseases are precipitated due to blockage or stagnation of ama and other malas that lead to stagnation of doshas.<sup>[17]</sup> Hence, it is necessary that these channels are kept clean and competent. Ayurveda emphasises that all diseases are the product of a weak Agni<sup>[18]</sup> and in turn, the main principle of treatment of all diseases in Ayurveda is to restore and to strengthen the Agni along with the digestion and metabolism.<sup>[19]</sup>

### **The model of CCINV-Figure.1**

Chemotherapy causes several distressing symptoms ranging from nausea and vomiting to low blood counts<sup>[20]</sup> which are understood as disturbances in all these five components of health. The pathophysiology of chemotherapy induced nausea and vomiting can be holistically explained by Ayurveda by the following model.

Ayurveda proposes that chemotherapy induces aggravation of both vaata and pitta doshas<sup>[21]</sup> Aggravated pitta results in heightened activity of pachaka pitta situated in the stomach region which is responsible for gastritis and jatharagni mandya (poor gastric fire manifesting as poor appetite). The associated aggravation of vaata dosha contributes to worsening of the jatharagni mandya and also leads directly to aggravation of udana vaata which is located in the chest and causes vomiting. As jatharagni is the master and the functioning of all other Agni's is controlled by this, jatharagni mandya results in mandya of all the 12 Agni's i.e. the 7 dhatvagnis and 5 bhutagnis. This systemic Agni mandya causes formation of aama (endo-toxins/antigens) which leads to obstruction of srotuses all over the body. As the lower part of the annavaha srotus is governed by apaana vaata, obstruction of this srotas and the appana vaata leads difficulty in elimination of wastes/mala resulting in constipation. Further, this obstruction to the free flow of apaana results in the activation of udaana vaata which is responsible for vomiting. Nausea is the manifestation of the upward force of the suppressed udana vayu.

Yoga is defined as voluntary mastery over all functions of the mind<sup>[22]</sup> through conscious voluntary slowing down of the rate of flow thoughts<sup>[23]</sup> to achieve balanced functioning of the mind<sup>[24]</sup> Thus yoga brings balance at all levels by slowing down and rest at all levels. There are several herbs [e.g. pippali, shunthi etc] recommended for reducing jatharaagni mandya. As the excited pitta gets cooled down, the pachaka pitta activity reduces which helps in reducing gastritis. Reduction of excited pachaka pitta activity also improves jatharagni. This in turn improves the functioning of other agnis [Dipana]. This helps in digestion of accumulated aama at all levels. This further clears the srotuses, relieves constipation by normalizing the flow of apaana and udana vayus. A good clearance of the bowel reverses the vaayu flow and stops the nausea and vomiting. Thus the Ayurveda concept proposes a reversibility model of CCINV and emphasizes on correcting the Agni mandya while yoga offers correction of vaata

imbalances through breathing techniques that corrects the master vaata, the prana vaata. [25, 26]

Apart from chemotherapy the antiemetic medications also may influence the Agni. Antiemetic therapy, in an effort to control vomiting, may worsen the jaatharagnimandya. Hence it appears that use of Agni assessment during the management of CCINV may add value. Though there is evidence for use of nonpharmacological mind body approaches such as Yoga in reducing nausea and emesis induced by chemotherapy [27, 28] there is no study to our knowledge on use of Ayurveda medications or concepts in managing chemotherapy induced nausea and emesis. Pilot randomized controlled studies comparing this with conventional management strategies are necessitated.

Figure1. AYURVEDA/YOGA MODEL OF CCINV

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