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Nutritional medicine in digestive system W.S.R. to liver health

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Abstract

The first and foremost aim of Ayurveda is to maintain the health of an individual as well as cure of diseases. Healthy status can be maintained with proper diet and treatment if any disease occurs. The pitta dosha, a fiery mind-body aspect linked to metabolism, is known to reside in the liver, which is known as its "seat" or "home". Liver aids in the digestion, metabolism, absorption and production of vital substances in the body every day. *jatharagni* which is stimulated by *samanaVata* digests food which is taken in proper quantity and in proper time. The "Agni" relates to the mechanics of digestion and metabolism; normal agni function maintains normal physiology and hence good health; agni vitiation results in diseases. *Jatharagni* and *Paachak* Pitta's efficiency are essential for *Pachan*. *Aam* is the *Apakva Ahara Rasa* created by the effects of *Mandagni* on food consumed. Many diseases have it as their underlying cause. Every material on earth has medicinal properties, according to Ayurveda, if used correctly. Our food has the potential to act as medicine for an effective treatment. Many food ingredients, such as *saindhavlan* (table salt), *Aardrak* (ginger), *Rason* (garlic), *Haridra* (turmeric) etc. are used on a daily basis to improve the taste and flavour of meals and enhance the proper metabolism, and increase the absorption of nutrients of food.

Keywords: Gut health; *Ayurveda*; Digestion; NCDs

1. Introduction

Ahara is defined by Ayurveda as a specified food/dietary schedule at various times of the day and seasons according to one's age and, most significantly, to suit one's individual constitution or *Prakriti* [1,2]. Because every animate entity relies on energy for survival, which comes from any sort of sustenance, in the *Taittiriyo Upanishad*, Ahara has been compared to Brahma (mythologically, the universe's creator) [3]. The *Bhagwat Gita* recognized nutrition as a source for the origin of life (Bhag.G.-3/14). In fact, proper eating, other living activities, and routines are addressed in addition to success in yoga (Bhag.G.-6/17) [4]. According to *Charka Samhita* (C.Su. -25/31) ahara is a causal component that has historical significance for dietetics in the context of the origin of Purusha (man) and his ailments [5]. On the other hand, the *Susruta Samhita* thoroughly described dietetics with regard to the applicability and value of nutrition in human existence, so demonstrating the historical significance of diet [6].

Food and medication, according to Ayurveda, are intertwined ideas that are essential for human existence as well as the prevention and treatment of ailments. Food affects the "physiome" or molecular processes of an organism [7]. Compared to any medicine, it is used in massive volume. Ahara is any substance ingested through the mouth into the alimentary canal, which, after adequate digestion, is changed into the tissue elements and serves purposes like fostering growth, aiding in loss recovery, and providing protection from illnesses for survival [2]. According to *Charka* Ahara encourages health and the avoidance of disease in order to maintain the equilibrium of the *Doshas* (biological humors) and *Dhatus* (body components) (C.Su. -25/33) [5]. Ahara enhances life span, happiness, memory, *Ojas* (immunome), and digestive capacity while restoring vitality, giving strength, and maintaining the body (S. Ci.-24/68) [6]. The primary focus of Ayurvedic dietetics is on the energetics of food as a way to balance the biological humors (*Dosha*). In contrast to the modern

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approach, Ayurvedic nutrition not only addresses the specific nutritional aspects of food but also considers our eating habits, the type of food we consume, *Agnibala* (the enzymatic activity of the digestive metabolism), how the food is prepared, whether it is cooked or blended, the season, our surroundings, and other factors. With the aid of other localized agni like *Klomaagni* (pancreatic fluids) and *Bhutaagni*, which are located in the gastro-intestinal tract, the *Jatharagni* is primarily in charge of the overall digestion of food in the *amashaya* (stomach) and in the *grahani* (intestine) (liver associated functions). In the GI mucosa-mediated processes, such as the activation and processing of enzymes, as well as the proper selection and absorption of nutrients into systemic circulation, where tissue-specific nutrition is delivered to various tissue sites by *srotas* (special channels), *jatharagni* plays a crucial role [8].

Thus, *Jatharagni* plays a crucial role in the management and maintenance of the body's general health, ensuring the good health and functionality of all the body's cells and tissues.

2. Concept of Aam

All illnesses are thought to originate from *Mandagni*[9]. Because this Agni is not capable of adequately digesting food to create Aahar Rasa (the essence of food). As a result, this partially or completely undigested food particle, known as Aam, accumulates in the stomach and is toxic to the body. It deprives the body of nourishment and is the primary cause of many illnesses.

2.1. Importance of Agni in Aam pachan

The principle of Agni, or biological fire, is crucial to Ayurveda. One of the key components in evaluating ideal health and internal hemostasis is agni. Ama, on the other hand, is a response to a toxin or pathogen, which is the cause of all diseases [10]. Impaired Agni, which then destroys Agni, is a major cause of Ama formation in the digestive tract. As a result, a vicious cycle of compromised Agni and Ama production is generated [11]. In order to effectively treat ailments, it is crucial to comprehend the fundamental link between Ama and Agni. In order to ignite the digestive fire and stop the development of Ama, the underlying cause of all diseases, it is crucial to maintain a healthy appetite, employ digestive stimulants, and ensure regular bowel movements [12]. Despite being a symbol of Teja Mahabhuta. for example, the dim lamp that can illuminate the space and dispel darkness cannot cook rice [13]. Similar to how Deepan Dravya can make someone hungry by activating *Jatharagni*, this stimulation is insufficient to for the food to be properly digested. It is fascinating to examine Deepan action using contemporary physiology of the process of digestive juice secretion and reflex action. Salivary secretions are induced and hunger contractions are triggered by the sight, smell, or mere thinking of food.

2.2. Food used for proper digestion

For our bodies to fully assimilate the food we eat, it must be transformed. According to current science, this process is referred to as "*Pachan*" and "Digestion" [14]. *Jatharagni* and *Paachak Pitta*'s efficiency are essential for *Pachan*. Before digestion and absorption, the body and mind must be ready to receive food. Prana Vayu and Saman Vayu help *Jatharagni* and *Paachak Pitta* with digestion and absorption. The creation of *Kshudha Vega* is greatly influenced by the flavor, aroma, and look of food (Hunger). Because a person feels the urge to eat following this stage of *Kshudha Vega* formation, it is important. For *Kshudha Vega Pravartan*, a *Jatharagni* in balance is crucial [15]. The underlying cause of all ailments, according to Ayurveda, is a depleted *Jatharagni* (*Mandagni*) [16]. A healthy hunger (*Kshudha*) is a sign that a *Jatharagni* is in a balanced state. When a patient complains of having a poor appetite, Deepan and *PachanDravyas* are frequently recommended to increase appetite.

Only the aroma of the Dravya of *Deepaniya Gana*, *Hingu* (*ferula foetida*), can cause salivation and hunger. *Charka's* description of *Deepaniya Gana* includes the ingredients *Nagar/Ardrak* (*Zingiber officinale*), *Marich* (*Piper nigrum*), *Ajmoda* (*Apium graveolens*), and *Hingu* [17] that are used in regular cooking to improve food flavor and aroma, finally causing digestive and salivary secretions and to improve appetite, *Bhavprakash* suggested chewing salt and ginger together [18]. Ginger and salt are both stimulants of *BodhakKapha* secretion and appetite stimulants. The onset of digestion is aided greatly by the secretion of *BodhakKapha*. *Jeerak* (*Cuminum cyminum*), *Dhanyak* (*Coriandrum sativum*), and *Nimbuk* (*Citrus limon*) are the three *Pachan Dravya*. Foods (*Pathya* or *Ahara*) and medications (*Ausadha*) are combined in *Ayurveda* under the notion of therapeutics in order to keep the *Doshas*, or physiological variables, in balance in accordance with individualized variability, or *Prakriti*, and other environmental circumstances [19]. An herb that is used as a food or spice, like turmeric or *haridra* (*Curcuma longa*), is also recommended for a variety of illnesses, from cancer to disorders of the gastrointestinal tract (GIT) [20]. In Ayurvedic medicine, nutrition thus becomes a vital role.

2.3. Role of liver

The liver weighs between 1.5 to 2.5% of the lean body weight and is regarded as the second-largest organ in the body. It carries out metabolic, secretory, immunological, circulatory, and excretory functions [21]. The liver receives a unique combination of arterial blood from the hepatic artery and venous blood from the portal vein, receiving around 30% of the cardiac output. The latter transports blood directly from the gut to the liver while providing roughly 70 to 75 percent of hepatic blood flow but only 50 percent of oxygen supply. As a result, the liver is susceptible to the medications consumed as they are absorbed from the intestine and allows for first pass metabolism [22].

It is vital for metabolism and is crucial for maintaining and controlling the body's levels of lipid and glucose as well as for energy metabolism. Maintaining blood glucose levels while fasting is one of the crucial tasks carried out by the liver. It does this by releasing glucose from glycogen and producing glucose from amino acids.

The bile acids are thought to be necessary for the absorption and transportation of dietary lipid-soluble vitamins and lipids, as well as for the clearance of medicines, harmful chemicals, and xenobiotics. Hepatic detoxification, which involves the liver metabolizing numerous types of medications to produce soluble excretable chemicals, is an additional function of the liver [23].

2.4. Importance of Gut health

The importance of gut health is shown by the fact that there is a broad list of digestive symptoms that lead people to seek medical attention and that these complaints are quite prevalent in the general population. These include the signs and symptoms of functional dyspepsia and irritable bowel syndrome (IBS), such as flatulence, bloating, regurgitation, heartburn, nausea, vomiting, constipation, diarrhea, food intolerance, incontinence, abdominal pain and cramps, loss of appetite, weight loss, and blood in the stools. These symptoms typically signify more or less benign disorders that may influence quality of life but not mortality. However, certain of the symptoms, such as anorexia, unexpected weight loss, dysphagia, persistent vomiting, severe stomach pain or diarrhea, melena, and hematochezia, must be interpreted as alarm signals necessitating a thorough investigation. The large intestine is the primary location for the approximately 10^{14} microorganisms that make up the GI microbiome [24,25].

The GI microbiome regulates the mucosal immune system, protecting against the colonization of potentially pathogenic microorganisms, supplying the gut wall with energy from undigested food (such as carbohydrates and other nutrients), and preventing the development of potentially pathogenic microorganisms [26]. It also serves as an important source of immune stimulants throughout life. As a result, the GI microbiota helps maintain homeostasis of energy, guards against mucosal infections, and probably lessens immune system sensitivity. Most significantly, it supports the preservation of a healthy GI barrier, which appears to be connected to infectious, inflammatory, and allergy illnesses [27,28]. Metabolism is the process in which food substances undergo chemical and energy transformation. In recent times, the term 'gut health' has become increasingly popular, as is evident by its more frequent use in the scientific literature and in the food industry.

3. Discussion

Dietary risk factors have increased awareness of non-communicable diseases globally (NCDs). The main causes of these NCDs are consuming fast food, not getting enough fruits or fiber in your diet, and being nutrient deficient [29].

Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. Each year, 17 million people die from a NCD before age 70; 86% of these premature deaths occur in low- and middle-income countries. Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from an NCD. Unhealthy diets and a lack of physical activity may show up in people as raised blood pressure, increased blood glucose, elevated blood lipids and obesity. These are called metabolic risk factors and can lead to cardiovascular disease, the leading NCD in terms of premature death [30].

Maintaining a healthy liver also involves prevention measures like eating a balanced diet rich in nutrients and herbs. Unfortunately, environmental contaminants, bad eating habits, alcohol, and the use of prescription and over-the-counter drugs frequently abuse the liver, which can cause damage and weakness and finally result in hepatitis, cirrhosis, and alcoholic liver disease. The utilization of natural goods like herbs to give the liver the everyday support it requires is increasingly being pursued by conventional medicine.

The rapid modernization has caused a significant change in nutrition, lifestyle, and health practices. The mortality and morbidity of non-communicable lifestyle diseases may be reduced by adjusting to healthy practices starting with daily

nutrition. Digestants called *Pachan Dravyas* are compared to *AmaPachan* in Ayurvedic literature, but they can also improve the GI tract's physiological activity. *Hingu* and *Ardrak* are two *Deepan Dravyas* (appetisers) with potent *Deepaniya* effects on Agni, hence they should also be included in a regular diet. Both *Nimbuk* (lemon) and *Rason* (garlic), which are potent *Pachaniya Dravyas*, should be consumed regularly to aid in proper meal digestion and absorption.

World liver day is observed on every 19 April, to spread awareness about liver related disease. by this the importance of liver is in front of world [31].

4. Conclusion

A person's health is determined by what they digest rather than what they eat. A better digestive system facilitates better absorption of nutrients. Nutrition does, in fact, have a significant impact on human disease and health, as well as the prevention and management of some common multifactorial chronic diseases. In present scenario to combat the NCDs, the nutritional medicine (ayurvedic herbs) plays an important role. In daily routine diet use of spices like black pepper, fenugreek, cumin seeds, fennel seeds, Cinnamomum, cardamom, enhance the digestive power. Many classical ayurvedic formulation has *TRIKATU* (*Sunthi, Marich, Pipli*), which is use as an ingredient for better absorption of drug along with maintenance of liver health.

Compliance with ethical standards

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Disclosure of conflict of interest

Authors have no conflict-of-interest.

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