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**Review Article**

# CONCEPT OF RANJAKA PITTA – A PHYSIOLOGICAL UNDERSTANDING

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## ABSTRACT

*Dosha, Dathu, Mala* together forms the basis of the body. The balance of these entities represents the healthy state and imbalance will cause various diseases. In normalcy, *Dosha* will be performing their own functions and individual *Dosha* will be having their own specific site.

There are five types of *Pitta* namely *Pachaka, Ranjaka, Sadhaka, Alochaka, Brajaka*. The *Visesha Sthana* of *Ranjaka Pitta* is said to be *Amashaya*. The other opinion is *Yakrit* and *Pleeha*. The main function of *Ranjaka Pitta* is said to be *Rasaranjana* i.e imparting color to *Rasa Dhatu* and aids in the formation of *Rakta Dhatu.*

Intrinsic factor secreted by the gastric glands is responsible for the absorption of vitamin $B_{12}$. The absorbed vitamin $B_{12}$ reaches the bone marrow and helps in the formation of hemoglobin.

The functions of *Ranjaka Pitta* can be related to the functions of intrinsic factor secreted by the gastric glands which is responsible for the absorption of vitamin $B_{12}$. The absorbed vitamin $B_{12}$ is needed for the syntheisis of hemoglobin, which imparts red color to blood. Vitamin $B_{12}$ have crucial role in erythropoiesis. Erythroblasts require vitamin $B_{12}$ for proliferation during their differentiation. *Yakrit* and *Pleeha* is considered as the Sthana of *Ranjaka Pitta* by some authors since in intra uterine life from third to fifth month liver and spleen takes over the function of formation of blood.

**Keywords**: *Ranjaka, Pitta, Shareera, Kriya,* intrinsic factor.

## INTRODUCTION

The individual is an epitome of the universe. All the material & spiritual phenomenon of the universe are present in the individual. Similarly all those resent in the individual are also contained in the universe[1].

Originating in cosmic consciousness, this wisdom was intuitively received in the hearts of the ancient scholars. They perceived that consciousness was energy manifested into the five basic principles or elements. Man is microcosm of the nature and so the five basic elements present in all matter also exists within each individual. Thus out of the womb of the five elements, all matter is born. The five basic elements exist in all matter. Water provides the classic example: - the solids of iced water are manifestation of the *Prithvi Mahabhuta* (earth principle). Latent heat in the ice (*Agni*) liquefies it, manifesting into *Jala Mahabhuta* (water principle). And then eventually it turns into steam expressing the *Vayu Mahabhuta* (air principle) the steam disappears into *Akasha* or space[2]. *Bhuta* is that which is not born out of something, but out of which something is born. It is the material cause of substances in the world. When we say *Bhuta* we mean that subtle level of existence, where as *Mahabhuta* refers to gross level of existence[3]. *Panchikarana* is the process through which invisible *Bhutas* combine with each other and form the visible *Mahabhutas* in such a way that all *Bhutas* are present together in each *Drisya Bhuta* in varying degrees of predominance. Thus in the physical world everything is a combination of *Pancha Mahabhutas* & we cannot see them independently[4].

*Dosha, Dathu, Mala* together form the basis of the body[5]. The balance of these entities represents the healthy state and imbalance will cause various diseases[6]. In normalcy, *Dosha* will be performing their own functions and individual *Dosha* will be having their own specific site. By mentioning the various *Sthana* of the each *Dosha* the different function performed by individual *Dosha* in different sites has been emphasised. The sub-types of *Dosha,* its location and function have also been mentioned[7].

Regarding the *Sthana* of various *Dosha* authors have different opinion. Later authors have added some more *Sthana* of *Dosha*. For example, ears among the location of *Vata*; umbilicus, eyes and skin among the location of *Pitta*; *Kloma*, nose, tongue among the location of *Kapha*[8].

There are five types of *Pitta* namely *Pachaka, Ranjaka, Sadhaka, Alochaka, Brajaka.* The *Visesha Sthana* of *Ranjaka Pitta* is said to be *Amashaya*. The other opinion is *Yakrit* and *Pleeha*. The main function of *Ranjaka Pitta* is said to be *Rasaranjana* i.e imparting color to *Rasa Dhatu* and aids in the formation of *Rakta Dhatu*[9].

Brief Physio- anatomical understanding of the Gastro-intestinal tract with reference to chemical and physical digestion is necessary to understand physiology of *Ranjaka Pitta*.

Two groups of organs compose the digestive system the gastrointestinal (GI) tract and the accessory digestive organs. The gastrointestinal (GI) tract, or alimentary canal, is a continuous tube that extends from the mouth to the anus through the thoracic and abdominopelvic cavities. Organs of the gastrointestinal tract include the mouth, most of the pharynx, esophagus, stomach, small intestine, and large intestine[10].

Overall, the digestive system performs six basic processes: Ingestion: This process involves taking foods and liquids into the mouth (eating). Secretion: Each day, cells within the walls of the GI tract and accessory digestive organs secrete a total of about 7 liters of water, acid, buffers, and enzymes into the lumen (interior space) of the tract. Mixing and propulsion: Alternating contractions and relaxations of smooth muscle in the walls of the GI tract mix food and secretions and propel them toward the anus. This capability of the GI tract to mix and move material along its length is called motility. Digestion: Mechanical and chemical processes break down ingested food into small molecules. In mechanical digestion the teeth cut and grind food before it is swallowed, and then smooth muscles of the stomach and small intestine churn the food. As a result, food molecules become dissolved and thoroughly mixed with digestive enzymes. In chemical digestion the large carbohydrate, lipid, protein, and nucleic acid molecules in food are split into smaller molecules by hydrolysis. Absorption: The entrance of ingested and secreted fluids, ions, and the products of digestion into the epithelial cells lining the lumen of the GI tract is called absorption. The absorbed substances pass into blood or lymph and circulate to cells throughout the body. Defecation: Wastes, indigestible substances, bacteria, cells sloughed from the lining of the GI tract, and digested materials that were not absorbed in their journey through the digestive tract leave the body through the anus in a process called defecation. The eliminated material is termed feces[11].

Two enzymes, salivary amylase and lingual lipase, contribute to chemical digestion in the mouth. Salivary amylase, which is secreted by the salivary glands, initiates the breakdown of starch. Dietary carbohydrates are either monosaccharide and disaccharide sugars or complex polysaccharides such as starches. Most of the carbohydrates we eat are starches, but only monosaccharides can be absorbed into the bloodstream. Thus, ingested disaccharides and starches must be broken down into monosaccharides. The function of salivary amylase is to begin starch digestion by breaking down starch into smaller molecules such as the disaccharide maltose, the trisaccharide maltotriose, and short-chain glucose polymers called _-dextrins. Even though food is usually swallowed too quickly for all the starches to be broken down in the mouth, salivary amylase in the swallowed food continues to act on the starches for about another hour, at which time stomach acids inactivate it. Saliva also contains lingual lipase, which is secreted by lingual glands in the tongue. This enzyme becomes activated in the acidic environment of the stomach and thus starts to work after food is swallowed. It breaks down dietary triglycerides into fatty acids and diglycerides. A diglyceride consists of a glycerol molecule that is attached to two fatty acids[12].

The strongly acidic fluid of the stomach kills many microbes in food. HCl partially denatures (unfolds) proteins in food and stimulates the secretion of hormones that promote the flow of bile and pancreatic juice. Enzymatic digestion of proteins also begins in the stomach. The only proteolytic (protein-digesting) enzyme in the stomach is pepsin, which is secreted by chief cells. Pepsin severs certain peptide bonds between amino acids, breaking down a protein chain of many amino acids into smaller peptide fragments. Pepsin is most effective in the very acidic environment of the stomach (pH 2); it becomes inactive at a higher pH.

First, pepsin is secreted in an inactive form called *pepsinogen;* in this form, it cannot digest the proteins in the chief cells that produce Pepsinogen is not converted into active pepsin until it comes in contact with hydrochloric acid secreted by parietal cells or active pepsin molecules. Second, the stomach epithelial cells are protected from gastric juices by a 1–3 mm thick layer of alkaline mucus secreted by surface mucous cells and mucous neck cells.

The stomach wall is composed of the same basic layers as the rest of the GI tract, with certain modifications. The surface of the mucosa is a layer of simple columnar epithelial cells called surface mucous cells. The mucosa contains a lamina propria (areolar connective tissue) and a muscularis mucosae (smooth muscle). Epithelial cells extend down into the lamina propria, where they form columns of secretory cells called gastric glands. Several gastric glands open into the bottom of narrow channels called gastric pits. Secretions from several gastric glands flow into each gastric pit and then into the lumen of the stomach. The gastric glands contain three types of exocrine gland cells that secrete their products into the stomach lumen: mucous neck cells, chief cells, and parietal cells. Both surface mucous cells and mucous neck cells secrete mucus. Parietal cells produce intrinsic factor (needed for absorption of vitamin B12) and hydrochloric acid. The chief cells secrete pepsinogen and gastric lipase. The secretions of the mucous, parietal, and chief cells form gastric juice, which totals 2000–3000 mL (roughly 2–3 qt.) per day. In addition, gastric glands include a type of enteroendocrine cell, the G cell, which is located mainly in the pyloric antrum and secretes the hormone gastrin into the bloodstream[13].

Each RBC contains about 280 million hemoglobin molecules. A hemoglobin molecule consists of a protein called globin, composed of four polypeptide chains (two alpha and two beta chains); a ringlike nonprotein pigment called a heme is bound to each of the four chains. At the center of each heme ring is an iron ion (Fe2_) that can combine reversibly with one oxygen molecule, allowing each hemoglobin molecule to bind four oxygen molecules. Each oxygen molecule picked up from

the lungs is bound to an iron ion. As blood flows through tissue capillaries, the iron–oxygen reaction reverses. Hemoglobin releases oxygen, which diffuses first into the interstitial fluid and then into cells[14].

**AIMS & OBJECTIVES**

To critically analyze the *Ranjaka Pitta*

## MATERIALS & METHODS

The *Bruhat Trayi* were scrutinised regarding the references for the *Guna* and *Karma* of the *Ranjaka Pitta*. Later, physiologico-anatomical aspects of the Gastro-intestinal tract with reference to chemical and physical digestion were studied from modern physiology books. Later, supportive correlation was done between *Ayurvedic* and modern views to build valid and reliable hypothesis regarding *Ranjaka Pitta* in relation to the various anatomical and physiological aspects of the Gastro-intestinal tract.

## DISCUSSION

There are five types of *Pitta* namely *Pachaka, Ranjaka, Sadhaka, Alochaka, Brajaka.* The *Visesha Sthana* of *Ranjaka Pitta* is said to be *Amashaya*. The other opinion is *Yakrit* and *Pleeha*. The main function of *Ranjaka Pitta* is said to be *Rasaranjana* i.e imparting color to *Rasa Dhatu* and aids in the formation of *Rakta Dhatu*.

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Each RBC contains about 280 million hemoglobin molecules. A hemoglobin molecule consists of a protein called globin, composed of four polypeptide chains (two alpha and two beta chains); a ringlike nonprotein pigment called a heme is bound to each of the four chains. At the center of each heme ring is an iron ion (Fe2_) that can combine reversibly with one oxygen molecule, allowing each hemoglobin molecule to bind four oxygen molecules.

The functions of *Ranjaka Pitta* can be related to the functions of intrinsic factor secreted by the gastric glands which is responsible for the absorption of vitamin $B_{12}$ and indirectly aids in the formation of red blood cells. Hemoglobin is an important component of the RBC which is synthesized in the presence of absorbed vitamin $B_{12}$ with the help of intrinsic factor. Vitamin $B_{12}$ have crucial role in erythropoiesis. Erythroblasts require vitamin $B_{12}$ for proliferation during their differentiation. *Yakrit* and *Pleeha* is considered as the Sthana of *Ranjaka Pitta* by some authors since in intra uterine life from third to fifth month liver and spleen takes over the function of formation of blood.

## CONCLUSION

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