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A CONCEPTUAL ANALYSIS OF BHRAJAKA PITTA

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ABSTRACT

Agni located in *Pitta dosha* is considered responsible for all transformations taking place in the body like metabolic reactions, hormonal actions etc. *Pitta dosha* have five divisions depending on the site and mode of action. *Bhrajaka pitta* is considered as the division of *Pitta* giving the color and luster to the skin and maintaining the body temperature [1]. *Bhrajaka Pitta* is acting on the external applicants like oils, lepas etc. and maintains the lustre of skin.

Keywords: Bhrajaka Pitta, Pitta, Melanin, MSH

INTRODUCTION

The *Pitta Dosha* is considered as the second number in the *Dosha* triad after *Vata Dosha*. The term *Pitta* derived from the root which means to heat, to burn or to warm. *Pitta* is having the predominance of *Agni Mahabhuta* [2]. So the *Pitta Dosha* is that entity in the body which is responsible for all fire like actions ie digestion and metabolism in the body. *Caraka Acarya* has mentioned that the *Agni* which is located in the *Pitta Dosha* gives rise to harmful or beneficial consequences when it is in abnormal or normal condition respectively [3]. *Pitta* is of two varieties. First one which is fluid and unctuous, the natural variety controlling the physiological functions and the second one is *Nirdrava* and *Rooksha* that causes *Jwara* and other diseases [4]. Biologically if we consider the qualities mentioned by *Acaryas*, *Pitta* is a combination of heat and liquid. Due to its liquid nature *Pitta* is mobile. As the *Dahana* and *Pacana karmas* of the body are occurring due to the action of *Pitta*, it is known as the *Antaragni* or internal fire.

Sthanas - *Pitta* is located in the whole body, but the general *sthanas* of *Pitta* are *Sweda*, *Rasa*, *Lasika*, *Raktha*, *Amasaya*, *Nabhi*, *Chakshu* and *Twak*. There are certain specific sites mentioned by *Acaryas* for *Pitta*, they are 1. *Amasaya* [5] 2. *Pakvamasaya Madhya* [6] 3. *Nabhi* [7]

Physiological functions of *Pitta Dosha* are:-

1. Visual perception
2. Production of hunger, appetite, digestion and thrist
3. Heat production and body temperature
4. Maintains colour, complexion and lustre of skin
5. Renders skin soft and thin
6. Courage, lucidity and cheerfulness of mind
7. Mental and intellectual power of brain
8. Maintains health by improving digestion and cellular activity

Types of *Pitta*: There are five types of *Pitta* named according to the functions. They are *Pacaka*, *Ranjaka*, *Sadaka*, *Alocaka* and *Bhrajaka* [8]. The major functions attributed

to the five types are *Pakti*, *Raga*, *Meda*, *Ojas* and *Tejas* and *Ushma* respectively [9]

***Bhrajaka Pitta*:** The *Pitta* which is responsible for the production of "*Bha*" (complexion) of skin is called as *Bhrajaka*. It is mentioned that the production of normal and abnormal temperature of the body as well as normal and abnormal colour of the skin which is mentioned as among the functions of *Pitta* are attributed to *Bhrajaka Pitta* [10].

Location of *Bhrajaka Pitta*: *Bhrajaka Pitta* is located in the skin [11].

Functions of *Bhrajaka Pitta*:-

1. Responsible for complexion of the skin
2. Responsible for regulation of body heat
3. Causes the digestion and ulitization of substances which are applied as *Abhyanga*, *Parisheka*, *Alepa* etc over the skin
4. Enhances the glow of ones on natural complexion

Bhrajaka Pitta is responsible for the manifestation of specific qualities of the body, emphasizes their importance, and creates different colors or tones of the skin, nails, eyes and hair. *Pitta* located in skin, is known as *Bhrajakagni*. Various applications on skin are digested because of this *Pitta* and make the skin shiny [11].

***Bhrajaka Pitta* in modern view:** The various shades of skin colour will depend on the intensity of various pigments present in the epidermis of skin. Various pigments that impart a wide variety of skin colors are Melanin, Haemoglobin and Carotene. The amount of Melanin causes the skin's color to vary from pale yellow to reddish brown to black.

Melanocytes: Only Melanin producing cells in the body are Melanocytes present primarily in the skin and eyes. Number of Melanocytes is about the same in all people. The amount of Melanin produced and transferred to Keratinocytes determines the differences in skin colour. Melanocytes synthesize Melanin from amino acid Tyrosine in the presence of an enzyme called Tyrosinase in the organelle called as Melanosome.

On exposure to UV rays: Exposure to UV rays increases the enzymatic activity within the Melanosomes and thus increases the Melanin production. Both the amount and darkness of Melanin increases, causing skin tanning. Tanning protects the body from further UV radiations.

Melanin: Melanin absorbs the UV radiation. It prevents the damage to DNA in epidermal cells. It also neutralizes the free radicals that are formed as a result of UV exposure. A tan is lost when Melanin containing Keratinocytes are shed from the Stratum Corneum.

Melanocyte Stimulating Hormone (MSH): MSH is secreted by the intermediate lobe of Pituitary gland. An increase in MSH will cause the darkening of the skin color. ACTH and MSH share the same precursor molecule, Pro-opiomelanocortin(POMC). Cushing's syndrome due to excess ACTH may also cause hyperpigmentation (Acanthosis nigricans). The level of MSH increases in humans during pregnancy. Different levels of MSH are not the major cause of racial variation in skin color. There are variations in their hormone receptors causing them not to respond to MSH in blood. Deficiency of melanin leads to Albinism (hypopigmentary congenital disorder).

Haemoglobin: Light- skinned individuals have less Melanin in the Epidermis. Epidermis appears translucent and skin colour

ranges from pink to red depending on the Oxygen content of the blood moving through the capillaries of the Dermis. Red colour is due to Haemoglobin, the Oxygen carrying pigment in Red Blood Cells. Amount and nature of Hemoglobin that circulates in the cutaneous blood vessels play an important role in the colouration of the skin.

Skin becomes:

i. Pale, when hemoglobin content decreases.

ii. Pink, when blood rushes to skin due to cutaneous vasodilatation (blushing).

iii. Bluish during cyanosis, which is caused by excess amount of reduced Hemoglobin.

Carotene: Carotene is a yellow orange pigment, which is the precursor of Vitamin A, used to synthesis pigments needed for vision. Stored in Stratum Corneum and fatty areas of Dermis and Subcutaneous layer. The effect of more intake of Carotene rich food is more apparent in light-skinned individuals.

Heat Gain or Heat Production In The Body

Various mechanisms involved in heat production in the body are:

1. Metabolic Activities
2. Muscular Activities
3. Role of Hormones
4. Radiation of heat from the environment
5. Shivering
6. Brown Fat Tissue

Heat Loss from the Body: Maximum heat is lost from the body through skin and small amount of heat is lost through the Respiratory system, kidney and GI tract. When environmental temperature is less than body temperature, heat is lost from the body. Heat loss occurs by the following methods:

1. Conduction (3%)
2. Convection (60%)
3. Radiation (15%)
4. Evaporation (insensible perspiration) (22%)
5. Panting

Regulation Of Body Temperature: Body temperature is regulated by Hypothalamus, which sets the normal range of body temperature. The set point under normal physiological conditions is 37°C. Hypothalamus has two centers which regulate the body temperature, they are

1. Heat loss center
2. Heat gain center.

Heat Loss Center: Situated in Preoptic nucleus of anterior Hypothalamus. Neurons in Preoptic nucleus are heat sensitive nerve cells, which are called thermoreceptors**.** Stimulation of Preoptic nucleus causes cutaneous vasodilatation and sweating. Removal or lesion causes increase the body temperature.

Heat Gain Center: Otherwise known as Heat Production Center situated in Posterior Hypothalamic nucleus. Stimulation of posterior hypothalamic nucleus causes shivering. Removal or lesion causes fall in body temperature.

Role Of Skin In Regulation Of Body Temperature: Skin plays an important role in the regulation of body temperature. Excess heat is lost from the body through skin by radiation, conduction, convection and evaporation. Sweat glands of the skin play an active part in heat loss, by secreting sweat. The lipid content of sebum prevents the loss of heat from the body in cold environment.

Thermoregulation: Homeostatic regulation of body temperature. Skin contributes to thermoregulation in 2 ways:-

1. Liberating sweat at the surface
2. Adjusting the flow of blood in the dermis

Sweat production from Eccrine glands increases in response to high environmental temperature or heat produced by exercise. Evaporation of sweat from the skin surface helps to decrease the body temperature. Blood vessels in the Dermis dialates, consequently more blood flows through the dermis, which increases sweating and the amount of heat loss from the body.

In case of low environmental temperature, less production of sweat occurs and heat is conserved.

DISCUSSION

Ushma and *Varna* are the functions attributed to *Bhrajaka Pitta*. Derangement of *Bhrajaka Pitta* will cause defective management of *Ushma* and *Varna* of *Twak* is also affected. *Sweda* is one of the seats of *Pitta*. Sweat plays an important role in maintaining the normal body temperature. In case of Albinism both the functions of *Bhrajaka Pitta* i.e *Ushma* and *Varna* are hampered. So a person with Albinism cannot get exposed to heavy sunlight as their body temperature will get increased. The color of skin will mainly depend upon the pigment Melanin and MSH hormone secreted from the Pituitary gland. Melanin is also having a role in temperature regulation also.

CONCLUSION

Bhrajaka pitta located in the skin is responsible for production of normal and abnormal colour of the skin as well as normal and abnormal body temperature. MSH secreted from Pituitary regulates the Melanin production from the Melanocytes located in the Epidermis of skin. Skin which is said as the seat of *Bhrajaka Pitta* plays the major role in regulation of body temperature in response to any change in external or internal environment with the help of sweat and pigment Melanin.

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