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# A CRITICAL REVIEW OF BHRAJAKA PITTA IN MODERN PHYSIOLOGICAL PERSPECTIVE

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## ABSTRACT

*Tridosha* is the basic theory in *Ayurveda*. *Vata*, *Pitta*, *Kapha* are the pillars of body. *Pitta* among three is responsible for all transformations taking place in the body like metabolic reactions, hormonal actions etc. *Pitta Dosha* is of five types, depending on the site and mode of action. *Bhrajaka Pitta* is responsible for giving the colour and lustre to the skin and maintaining the body temperature. Different medications, *Abhyanga* (oil massage), *Parisheka* (pouring hot water or oil) *Avgaha* (tub bath), *Lepa* (paste) are absorbed and digested due to *Bhrajaka Pitta*. In this article correlation of the physiological activity of *Bhrajka Pitta* with modern medical science has been stated. For this study, the basic materials have been collected from the *Ayurvedic* classics with the available commentaries, as well as Text books of modern medical science better understanding of the concept and its comparison with contemporary science.

**KEYWORDS:** *Pitta*, *Bhrajak Pitta*, Skin, Melanin, Pigmentation *etc.*

## INTRODUCTION

First of all *Acharaya Sushruta* has given the five names of types of *Pitta* i.e *Pachaka Pitta*, *Ranjaka Pitta*, *Sadhaka Pitta*, *Aalochaka Pitta* and *Bhrajakaa Pitta*. *Acharaya Sushruta* called *Bhrajaka Pitta* as *Bhrajak Agni*. It is exist in the skin and responsible for natural complexion of skin, absorbs the perspiring part of skin and for glowing of skin etc. It explains

that the normal texture of skin totally depends of *Bharajaka Agni* or *Pitta*. Although *Acharaya* has also considered the constitution of *Panch Mahabhuta* is responsible for giving a specific colour to skin, yet the maintenance of that natural complexion or colour is done by *Bhrajaka Pitta*. At the time of embryo formation the situation of *Bhrajaka Pitta* has got fixed in the skin and the colour develops, is according to the amount of *Bhrajaka Pitta*. At the time of embryo formation, when the collaboration of *Tridosha* (*Vata*, *Pitta* and *Kapha*) occurs with *Shukra* and *Shonit*, the *Prakrati* is decided according to amount of *Bhrajaka Pitta* which can be maximum, medium or minimum. So if seen on the above mentioned basis, the *Tridosha* also seems to be present in a variable amount. It means the natural stage and amount of *Bhrajaka Pitta* (a type of one of the *Tridosha*) should be decided at the time of embryo formation, so that the normal texture of body also get decided at same time. This whole process should have dependency over *Bhrajaka Pitta*. The process of production of colour in skin with the help of *Bhrajaka Pitta* has been explained by different *Acharaya*.

***Charaka samhita*:** According *Charaka Samhita Acharaya Charaka* has not separately given name to the *Bhrajaka Pitta* but mentioned in different context for formation of colour of skin. He also frankly accepted the importance of Pitta in texture of body. In *Charaka Samhita, Sutra Sthana* 12 (*Vata Kala Kaliya*) Acharya has accepted the opinion of *Marichi* that *Prakrat* and *Vikrat* complexion of skin depends on the *Prakrat* & *Vikrat* functioning of *Pitta.*[1] Maintenance and variation of body temperature, variation in the normal complexion of body, these comes under the functioning range of Pitta. At some other place, *Acharava Charaka* has included softening and shining of body under wanting of *Pitta.*[2] In *Charaka Chikitsa Sthana,* the same functions of *Pitta* are also mentioned. *Acharaya Chakrapani* has explained clearly the *Bhrajaka Pitta* while describing the *Karmas* of *Pitta* in *Charaka Samhita Sutra Sthana*. Regulation of body temperature and body colour is done by *Bhrajaka Pitta* placed in the skin.

***Sushruta samhita*:** *Acharaya Sushruta* has clearly mentioned five types of *Pitta* and their *Sthanas*. He has described *Bhrajaka Pitta* in the form of *Bhrajaka Agni* and has accepted skin as its *Adhishtana*. *Bhrajaka Pitta* is present in the skin, thus it absorbs the substance used in the process of *Abhyanga Avasechana*, *Avagahana* and *Aalepa*[3] *Acharaya sushruta* has again mentioned about *Bhrajaka Pitta*. It means it helps in perspiration, wetting and shining of skin and maintenance of body temperature. Here it can be clearly understood that *Bhrajaka Pitta* has a special contribution towards maintaining the natural colour of skin.[4]

***Ashtanga sangraha*:** *Acharaya Vriddha Vagbhatta* has followed the *Acharya Sushruta* and given the five types of *Pitta* with their names and *Bhrajaka Pitta* is one of them. According to *Ashtanga Sangraha Bhrajaka* Pitta is known to be seated in the skin[5] While describing the *Karmas* of *Pitta, Acharya Vriddha Vagbhatta* has followed *Acharaya Sushruta*. If an analysis is made then it is clear that natural and unnatural colouring of skin depends on *Bhrajaka Pitta.*[6]

***Ashtanga hridaya*:** *Ashtang Hridayakar*, following previous *Acharyas*, has accepted *Bhrajaka Pitta* as a type of *Pitta* and skin as a seat of it. It maintains colour of skin and absorbs the watery part of skin.[7] In the *Sarvaangsundra* commentary of *Ashtanga Sangraha Acharaya Arundatta* has explained the above quotation that[8] the *Pitta* found on the skin is known as *Bhrajaka Pitta*. This *Pitta* gives colour, shining and glow to the skin.

***Bhaavprakasha*:** Acharya *Bhaavprakasha* has also followed the elderly *Acharayas*, while describing *Bhrajaka Pitta*. He has accepted *Bhrajaka Pitta* to be seated in the skin and digest the medicines externally applied on the skin.[9]

***Sharangdhara samhita*:** *Bhrajaka Pitta* is a type of *Pitta* which is present on the skin. It makes the skin glow and absorbs the externally applied substances through *Abhyanga* etc.[10] Here also it is clarified that *Bhrajaka Pitta* in the skin gives a coloured appearance to the skin. It provides glitter to the skin. In the *'Deepika'* a commentary of *Shrangdhara Samhita, Acharya Aadhmalla* has stated that Here *Acharya* has more clearly defined that *Bhrajaka Pitta* digest the substances applied on skin and makes the skin glow due to *Ushna Guna* present in it. According to *Acharya Sharangdhara* the skin is indication only to its outermost layer i.e., *Avabhasini*, it means out of seven layers of skin only the *Avabhasini* contributes in performing the above functions. Other layers performs functions which are different form *Avabhasini's* functions.[11] *Acharya Aadhmalla* has also accepted this fact that only *Avabhasini* is playing an important role in digestion of applied medicines.

**Sthana of bhrajaka pitta**

*Acharaya Sushruta* has given 7 layers of skin in which *Avabhasini* is the first one.[12] This layer can be effected by the shadow (or pigmentation) of all the five *Pancha Mahabhootas*, and has the capacity of reflecting all the colours, this indicates that *Bhrajaka Pitta* is seated in the *Avabhasini* layer of skin. *Acharya Charaka* has given six layers of skin and has named only the first two layers as *Udakdhara* and *Asrigdhara*. He has not given the name of

upcoming four layers and just mentioned the names of diseases occurring in those layers. In these *Kilas* occurs in the third layer while *Kushtha* occurs in the fourth layer.[13]

*Acharya Vagbhatta* has also given 7 layers of skin but particular name of them were not given. But *Arundatta* in his commentary has given the names to 7 layers of skin as *Bhasini, Lohita, Shweta, Tamra, Tvagvedini, Rohini, Maansdhara.*[14]

**Functions of bhrajaka pitta**

According to Acharya Sushruta, providing a specific colour to skin is the main function of *Bhrajaka Pitta.*[15] *Acharya Dalhana* has described the functions of *Bhrajaka Pitta* as the producer of the shadow (*Chhaya*) or the grace (*Prabha*). *Chhaya* actually express the basic colour of skin while the *Prabha* expresses the basic colour in improved manner. This *Prabha* and *Chhaya* are displayed with the help of *Bhrajaka Pitta* in the skin. In the development of skin, *Acharya Sushruta* has stated that assimilation or *Pachana* occurring after the fusion of *Shukra* and *Shonita* will give rise to 7 layers of skin. For understanding this, *Acharyas* has compared it with process of Boiling of milk giving rise to the creamy part of milk.[16] At the time of fusion of *Shukra* and *Shonita* all the organs are present but are not expressed due to their minuteness, this is the blastocele stage where the mitotic division occurs and development proceeds. In the same stage, the three germinal layers ectoderm, endoderm and mesoderm forms to give rise to different structures in the body. The outer layer forms the epidermis and inner to it is the dermis. In the third month *Acharya Sushruta* has given the formation of *Panch Pindika.*[17] In this stage, the layers of skin completely covers this *Panch Pindikas*, means the skin is totally expressed in this stage. The colour of the skin also develops simultaneously. *Varna* colour of *Panchmahabhoota* and *Virya* are helpful in giving colour to the skin. According to *Acharya Charaka Gaura Varna* develops from *Teja* and *Jala Mahabhoota*, *Krishna Varna* develops from *Prithvi* and *Vayu Mahabhoota*. When all the *Mahabhoota* are present equally then it give rise to the *Shyama Varna.*[18] According to *Acharya Sushruta* "*Garbhasharira*" develops from *Panchmahabhoota*. Although all the *Mahabhootas* are required in it, yet the colouring occurring with the help of *Teja Mahabhoota*. When the *Jala Mahabhoota* is chief among *Panchmahabhoota* then it give rise to *Gaura Varna* to the embryo. When *Teja* and *Prithvi Mahabhootas* are present chiefly then *Krisha Varna* develops leading of *Prithvi* and *Aakasha Mahabhootas* gives *Krishnashyam Varna* and when *Jala* and *Aakasha Mahabhootas* leads then give rise to *Gaura-Shyam Varna* to the skin.[19] According to *Acharya Vagbhatta*, the colour of the skin is decided by the

colour of *Virya*. If the *Virya* or semen is whitish like *Ghrit* (Ghee) then the fetus is white or *Gaur* in colour. If the *Virya* is in oily form then fetus is of blackish or *Krishna Varna*. If the *Virya* is honey or *Medhu* like then give rise to *Shyam Varna*. Along with these, the food habits of mother is also a complementary factor responsible for the colour of skin. If a pregnant lady is having food habits which consist of milk and *Madhur Rasa*, and actively participate in watery activities then the fetus is fair or *Gaura* in colour. If mother takes *Tila* etc. *Vidahi* food then fetus is *Krishna* in complexion. If the mother takes mix food then the fetus is *Shyam* or wheatish in colour. In this way. *Acharyas* has considered *Pancha Mahabhoota*. (*Charaka* and *Sushruta*) *Virya* and the food habits of mother (*Vagbhatta*) to be responsible for formation of colour in skin. It is proven fact in modern science that persons living in high temperature areas are having dark complexion while people living in low temperature areas are having a fair complexion. In the same way the habits of a pregnant lady effect the pigmentation of skin of body. It means the food habits and living habits of a pregnant lady directly effects the colouring of skin of baby. In the nine month regime of a pregnant women as given by *Acharya Charaka* and *Vagbhatta*, in the sixth month, as compared to other months the colour of skin and her activities become more prominent.[20,21]

**Moderen view**

Skin is one of the most vital and largest organ of the body. It should not be considered as a merely a covering of the body. It is infect the mirror of the body which reflect the numerous internal disorders even. It is self-replacing and multifunctional. The skin being sensitive to pain, pressure, touch, cold, hot and trauma is indeed a unique "sense organ" more then it skin is the protective boundary between the organism and the environment. Skin covers the entire external surface of the body including the external auditory meatus and the lateral aspect of the tympanic membrane. It is continuous with the mucosa of alimentary, respiratory and urino-genital tract at their respective orifice, where the specialized skin of mucocutaneous junction occurs it also fuses with the conjunctiva at the margin of eyelids and with the lining of the lacrimal canaliculi of the lacrimal puncta. In clinical practice dermatological problems account for about 12% of total medical problems. Among skin disorders, disorder of pigmentation covers a big spectrum. They not only interfere with the normal skin functioning but also hamper the internal environment of the body even. In pigmentary disorders, disorders related to the hypopigmentation needs attention, where along with soma, psyche is involved much more.

**Melanin:** This melanin is responsible for the normal color of skin, without which the skin becomes white in color. The cells which produce melanin pigment are known as melanocyte, embryologically which are derived from nural crest. Which are generally observed in relation to the surface structure of the organism. Melanin is the principally pigment responsible for the color of skin, hair and eyes. Melanin is also a density filter that decrease the harmful effect of ultra violet light on the skin.

Factors responsible for color of skin are haemoglobin (in both the oxygenated and reduced state), carotenoids and melanin pigment. Carotenoides are yellow pigments that found in the epidermis and subcutaneous fat. (Zuckermen S. & Parkes A.S. Endocrinol I 430, 1939) Melanin was produced by melanocytes and are transferred to the surrounding epidermal keratinocytes.

Two types of melanin pigmentation occur in humans. The first is constitutive, that is genetically determined melanin pigmentation in the absence of sun exposure and other influence. The next is facultative, which results from sun exposure. Other factors like endocrine influence pregnancy, nutrition status and some autoimmune disorder also influence the Variations in the degree of pigmentation occur in various region of body and are diferent in various ethnic groups. In Asian people, the lightest area is lumber region and the darkest is upper thigh (Br. Jr. of Dermatol 1973) skin color (Fitzpatrie TB1974).

**The melanocyte:** A Melanocyte is a specialized cell located in the skin, which produces melanin (pigment). All humans have roughly the same number of pigment cells in their skin. Those with darker toned skin, have pigment cells that are able to store more melanin within them.

**Endocrine influence:** The biologically important lightening agents are serotonin, noradrenalin and adrenalin. Estrogens, androgens, pituitary and adrenalin hormone controls melanin pigmentation.

**Melatonin:** The role of melatonin on mammalian epidermal melanocyte is tentative. It is a 5,6-dihydroxyindole derivative and is the powerful lightning agent in human.

**MSH:** Two melanocyte stimulating hormone (a- and B- MSH) have been isolated from the intermediate lobe of pituitary gland. These are polypeptide in nature and are found to be the most powerful darkening agent in human skin.

**Factors which effect melanogenesis:** Proper digestion, absorption and distribution of nutrients, Trace minerals like copper, zinc, iron etc., Folic acid, vitamin C. and vitamin D., Hormones like adrenalin, noradrenalin, MSH etc., Enzymes like tyrosinase, Physical agent like UV rays, Sun exposure. Pigmentation is controlled or affected by a number of factor, they are:

a. **Genes:** It has been estimated that between three to six pairs of genes responsible for genetic color (consecutive color) only. Genetic or consecutive Based on study of variation skin colors in American blacks and may account for black white color gradient. These genes pairs are color of the skin is the color of unexposed color (color which arises from sum induced tanning reaction or increased MSH) is not yet known.
b. **Hormone:** Melanocyte stimulating hormone(MSH) appear to act by a direct effect on adenylate cyclase, which result in increased cyclic AMP leading to increased tyrosinase and melanosome synthesis. Aggregation and dispersion of melanosomes probably play little part in the pigmentation of human.
c. **Ultra violet radiation:** Melanocyte by producing and transferring the melanin provide defence against the biological damage of skin by ultra violet radiation (UVR). In. Exposure of sun to UVR causes the activation of an integrated mechanism (tanning) for the formation of dense organelles containing chromoprotein melanosomes. Within the epidermal cells, melanosomes scatter and absorb ultra violet radiation and remove the damaging free radicals that are generated in the skin after UVR exposure.
d. **Chalones and Glycopeptides:** Specific chalones and glycopeptides may markedly affect melanogenogenesis and melanin pigmentation by exerting negative feedback control and regulating the mitotic activity of melanocyte and keratinocytes.

## DISCUSSION

After reviewing the all aspects of *Ayurveda* about *Bhrajaka Pitta* we can say that maintenance of *Ushma* and *Varna* are considered the primary functions of it. Any derangement of *Bhrajaka Pitta* will cause defective management of *Ushma* and *Varna* in a person. *Sweda* is one of the seats of *Pitta*. *Sweda* plays an important role in maintenance the normal body temperature. For example if a person suffers from albinism than both the functions of *Bhrajaka Pitta* are hampered. So that person with Albinism is unable to tolerate heavy sunlight because of body temperature and sweating 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 which leads to different types of skin colors. As well as normal and abnormal body temperature is also depends upon *Bhrajaka Pitta*. MSH secreted from Pituitary gland which regulates the Melanin production from the Melanocytes located in the Epidermis of skin. Skin is considered as the seat of *Bhrajaka Pitta* it plays the important role in the 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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