CONCEPT OF ENDOCRINOLOGY IN AYURVEDIC PERSPECTIVE WITH SPECIAL REFERENCE TO TEJMAHABHUT.

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Received on: 27/02/2020; Revised on: 18/03/2020; Accepted on: 21/03/2020

ABSTRACT

Endocrine system controls body activities by releasing mediators, which are called hormones. Hormones are information transferring molecules, which are released from one group of cells and travel via blood stream but regulates activity of cells in the other one or different group of cells. In Ayurveda, Endocrinology is not separately mentioned. According to Ayurveda, the universe is panchabhutic. It simply means that the universe is made up of five basic elements. On this line, the human body is considered panchbhautic. Whatever exists in this universe, that is represented in human body. Prithvi, Aap, Tej, Vayu, Aakash these are the five basic elements which construct the human body. Out of these five elements, TejMahabhuta performs activities in the universe, as well as in the human body. TejMahabhuta gives energy to the universe. This activity is performed by the Sun. energy is responsible for bio transformative activities. These activities are performed in body by Agni and Pitta Dosha. Any activity which is related to biotransformation is considered to be due to TejMahabhuta. Hormones causes biotransformation activity and its characteristic features are similar to the functions of TejMahabhuta. When we study the characteristics and functions of TejMahabhuta and Hormones, we will find relation among them. This perspective approach is discussed in this paper.

Keywords: Hormone, Tej mahabhut, Concept of Agni.

1. INTRODUCTION

Endocrinology takes important role in Homeostasis mechanism of body. Endocrine system controls body activities by releasing mediators, which are called hormones. Hormones are information transferring molecules, which are released from one group of cells and travel via blood stream but regulates activity of cells in the other one or different group of cells. In Ayurveda, Endocrinology is not separately mentioned. According to Ayurveda, the universe is panchabhutic. 1 It simply means that the universe is made up of five basic elements. This shows that the human body in the Universe is considered to be panchabhutic. Whatever exists in this universe, that is represented in human body. Prithvi, Aap, Tej, Vayu and Aakash, these are the five basic elements which construct the human body. 2

Out of these five elements, TejMahabhut performs activities in the universe, as well as in the human body. 3 TejMahabhut gives energy to the universe. 4 These activities are performed by the Sun. Energy is responsible for bio transformative activities. These activities are performed in body by Agni and Pitta Dosha. 5 Any

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activity which is related to biotransformation is considered to be due to Tejmahabhuta. Endocrine glands releases hormones. Hormones cause bio transformative activities and its characteristic features are as similar as that of Tejmahabhut. The activity of hormone and characteristic functions of TejMahabhut. When we study both of them, we will find the relation amongst them. This perspective approach will be discussed in this paper.

2. MATERIAL AND METHODS

All available literature related to the study was reviewed from Ayurvedic classical texts and Modern text books. Collected literary data was analyzed to find out similarities and dissimilarities between Tejamahabhuta (Agni) and Hormones were presented.

3. OBSERVATIONS & RESULTS

One of the principle functions of the endocrine system is to maintain internal homoeostasis. The second principle function is reproduction. The bio transformative activity is carried out by hormone. In human body this function is carried out by Agni and Pitta Dosha. This phenomenon is called as Parinaman, or Pak process. Therefore, hormone itself has properties of Tejmahabhuta. As soon as hormone reaches its target cells, it can affect the intracellular metabolism and modify the cell function. Why it is necessary to include endocrine secretions i.e. hormone in Tejmahabhut? The answer is, the characteristic feature of Tejmahabutais similar as to the hormones. The characteristic features of TejMahabhut are Ushna, Tikshna, Sukshma, Laghu, Ruksha, Vishada, Daha, Paka, Prabha, Prakasha and Varnakar.

Ushna (Hot)

Some hormones increase body heat while circulating through blood. E.g. HCG, Thyroxine.

Tikshna (penetrating power)

Certain hormones, particularly the steroid hormones are able to penetrate the cell membrane due to their smaller size and lipid permeability. As a result, these compounds can modify intra cellular metabolism directly. E.g. Oestrogen.

3. Sukshma (microscopic)

Hormones act in very low concentration. As soon as hormone reduces its target cell, it can affect the intracellular metabolism to modify the cell function. E.g. Glucagon, Growth hormone, Testosterone, Oestrogen, Vasopressin.

4. Laghu (low molecular weight)

Hormones are destroyed and excreted as soon as their functions are over. Some hormones work quickly and destroyed quickly. E.g. Epinephrine (Adrenaline).

5. Ruksha (unctuous)

Hormones are not ordinarily stored, except in the gland of origin. They do not have any accumulative action. E.g. Thromboxane A2 causes vasoconstriction.

6. Vishad (detergent like)

Some of the prostaglandins are anti lipolytic agents. These hormones inhibit the release of free fatty acids from adipose tissue.

7. Roop (structure)

The hormones have specific structure. The known hormones include protein with molecular weight of 30,000 or less. The majority of hormones are peptides, proteins, glycoproteins or amino acid derivatives and steroids. As per body point of view, TejMahabhut is represented by Agni and Pitta Dosha. Acharya Charaka mentioned that function of Agniis carried out through pittadosha.16 Hormones are released / secreted in to the blood stream prior to use. According to Ayurveda, Blood has panchabhutic properties. Blood is the location site for the Pitta Dosha.

Ushnatva (Hotness) of Agni is carried out by Pitta Dosha via blood stream. Mechanism of hormones is carried out by blood, so hormones is considered as TejMahabhuta substance. Hormones activity is carried out by Agni or Pitta. According to Ayurveda vitiation of Agni causes disturbances in health issues.
ragni plays important role for digestion. The characteristic feature of Jatharagni is present in Dhatwagni.\textsuperscript{19} If the potency of dhatwagni is decreases, respective dhatu will be increased in mass and if the potency of dhatwagni increases respective dhatu will be decreases in size.

The effects produced by the hypo activity or the hyperactive activity of a particular gland should not be explained by the fault of that gland, but also a by the changes produced in other related glands (central action) and due to the disturbances of the peripheral action of the related hormones.

4. DISCUSSION

In human body, cellular metabolism is under control of dhatwagni. They are Rasadhatwagni\textsuperscript{20} etc. Rasadhatwagni acts on rasa nutrient part of Aahararasa (chyme).\textsuperscript{21} After that Rasadhatu nourishes and excretory part, kaphawill be formed. In addition, upadhatus- tanya and raja will be formed, like that dhatu nourishes by itself with dhatwagni. Similarly, hormone acts on special cells of the body. As soon as hormone reaches its target cells, it can affect the intracellular metabolism to modify the cell function.

If the potency of the dhatwagni is low, the effect on that dhatu will be expressed. Similarly, the potency of the dhatwagni is high the effect on dhatu will show characteristic feature. Like that, if a hormone is present in excess the number of target cell receptors may decrease, an effect called down regulation. For example - when certain cells of testes are exposed to a high concentration of Luteinizing hormone (LH), the number of LH receptors decreases. Down regulation decreases the responsiveness of target cell to the hormone. In contrast, when a hormone is deficient, the number of receptors may increase. This phenomenon is called as up regulation makes the target tissue more sensitive to that particular hormone.\textsuperscript{22}

When dhatwagni diminishes his potency, then particular dhatu increased in mass and function and when dhatwagni accelerated his potency then particular dhatu decreases in mass and decreases its function also.\textsuperscript{23} Thyroxine, Tetra iodothyronine are the thyroid hormone. Thyroxine has a protein anabolic effect including enhancement of growth of all body tissue.

In hyperthyroidism excess protein catabolism causes muscular weakness, extreme fatigue, mild tremors in the hands, body weight decreases, intolerance to heat, increased sweating.\textsuperscript{24} Hence, we can say that thyroxin acts like Mansadhatwagni. Increased secretion of thyroid hormone is called as hyperthyroidism. The characteristic feature of hyperthyroidism is same as Mansadhatu kshaya.\textsuperscript{25} Glani, Gand shushkata, Sphika shushkata, Sandhivedana are the characteristic features of Mansadhatu Kshaya.\textsuperscript{25} Myxedema is the hypothyroidism in adults, characterized by generalized edematous appearance. Swelling of the face, bagginess under the eyes, non-pitting type of edema, increase in body weight etc. these symptoms\textsuperscript{36} are as similar as to Mansa dhatu Vridhhi.\textsuperscript{27} Gandarbuda, Granthi, Gand vrddhi, Udarvrddhi, Kathadi adhimansa etc. are the characteristic features of Mansadhatu Vridhhi.\textsuperscript{27}

Insulin, Gluco-corticosteroids, Glucagon these hormones which act like Medo-dhatwagni. Insulin is secreted by Beta cells of Islets of Langerhans of pancreas. Insulin stimulates the synthesis of fat. It also increases the storage of fat in the adipose tissue. Insulin transport the excess glucose into the cells particularly the liver cells.\textsuperscript{28} Insulin promotes the synthesis of lipids by activating the enzymes, which converts the glucose into fatty acids -> fatty acids into-> triglycerides. Deficiency of insulin causes DM; this type of DM is called Insulin dependent DM (IDDM). Diabetes develops due to the absence or reduced no. of insulin receptors in the cells of the body is called type II diabetes or it is also called as non-insulin dependent diabetes mellitus (NIDDM).

The pathogenesis of Prameha caused by decreased potency of Medodhatwagni\textsuperscript{29}. Due to lack of potency in Medodhatwagni excessive fat stores in the body and characteristic features of
Medodhatwagni vriddhi. \(^{30}\) Insulin promotes the storage of fat in adipose tissue. In Medovriddi, the role of Insulin hormone is very important. \(^{31}\) Glucagon secreted by alpha cells in the Islets of Langerhans of pancreas. Glucagon shows lipolytic and ketogenic action. It increases the release of free fatty acids from adipose tissue. \(^{32}\) Medo dhatu deteriorated (Medadhatu kshaya) features are found in the over activity of Glucagon hormone. \(^{33}\)

Parathormone, Calcitonin, these hormones act on the metabolism of Calcium. These hormones maintain blood calcium level. \(^{34}\) Parathormone enhances the resorption of Calcium from the bones (Osteoclastic activity) by acting on osteoblast & osteoclasts of the bone. Role of Parathormone in the activation of Vit. D is very essential for Calcium absorption from the g.i. tract. Calcitonin stimulates osteoblastic activity & facilitates the deposition of Calcium on bones & inhibits the resorption of Calcium from bones. \(^{35}\) These both hormones acting on bone, their functions are as similar as Asthi Dhatwagni.

Testosterones is responsible for the distinguishing characters of masculine body. \(^{36}\) Oestrogen is responsible for the development of secondary sexual characters in females. \(^{37}\) Testosterone & Oestrogen both are responsible for reproductive activity, so their functions are as similar as Shukragni.

5. CONCLUSION

Various hormone activities act like Agni. Some hormones are act on GI Tract under the influence of Jatharagni; some hormones are act on cellular metabolism under the influence of Bhutagni and Dhatwagni. According to Ayurved, all biotransformative activities can be carried out by Tej mahabhut. Therefore, we can say that endocrine hormones are the part of Tej mahabhut.

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Source of Support: Nil; Conflict of Interest: None declared.