



Adrenal Insufficiency -An Ayurvedic View

Dr. Sreelekshmi. G

Assistant Professor, Pankajakasturi Ayurveda Medical College and Research Center, TVM

Abstract:

An imbalance in the arrangement of *Agni* (digestive enzymes) and *Dosha* are the major reasons behind all disorders. This gradually act upon Immune system, causing *Oja Kshaya* (deterioration of body strength) and adversely affect each and every *Dhatu* (tissue level). In some cases one's mind will also get affected leading to either depression ,anxiety or stress and so on. Among the clinical features of Adrenal Insufficiency, Fatigue, depression, anorexia, emaciation diarrhoea, nausea, vomiting ,hyper pigmentation etc: mimic various disorders. Hence there is chance for misdiagnosis. However through proper investigations, Adrenal Insufficiency can be diagnosed. The main objective of presentation is to provide an awareness about the gland, its hormones and associated diseases mainly the autoimmune Adrenal Insufficiency . The Adrenal gland and Kidney (*Vrikka*) together forms the *Moolasthan* (origin or governing site) for *Medovaha Srotas* (channels carrying nutrition). *Medas* (fat / adipose tissue / marrow) being *Pruthvi* (earth elements) and *Jala* (water elements) predominant area , *Kapha dosha* will be dominant in this area. There will be the involvement of *Apana Vata* (type of vata) also in this area. The *Lakshana* or symptoms of patients often shows the possibility that there is *Vata Prakopa* (vitiation of Vata) and *Kapha Kshaya* (decreased kapha). Hence treatments should be scheduled to regulate *Apana Vata* and *Kapha Vaishamyata* (imbalance), rapy. such as *Brimhana* therapy . Thus *Dhatupaka* or *Dhatu Kshaya* (degeneration of tissues) can be corrected and *Ojovrudhi* (increase in health or strength) can be achieved .

Key words: Adrenal Insuficiency, *Apana Vata* and *Kapha Vaishamyata* ,*Ojovridhi*

Introduction

The Endocrine system consists of collection of glands which produce chemical messengers called Hormones that regulate the whole metabolism, growth, development, tissue functions, reproductive functions, sleep, emotions, mental activities and so on. The Hormones are targeted towards particular cells or organs for performing their functions. If the receptors of particular hormones are not responding or if the secretory level of hormones are too low or too high this can negatively effects the whole metabolism and gradually the entire functions get dearraged , leading to Endocrine disorders of various types. From the Adrenal cortex of Adrenal glands or Supra renal glands ,hormones such as Glucocorticoids, Mineralocorticoids and Adrogens are released.The Glucocorticoids are secreted from the Zona Fasciculata cells. The Cortisol and Corticosterone comes under the catagory of Glucocorticoids. The Cortisol being more potent is able to perform few activities of Mineralocorticoids also.¹ Hence in the decreased level of Cortisol, we can notice few symptoms which commonly occurs during Insufficient Mineralocorticoids.

Aims

- To get an awareness about the Adrenal gland
- A view on Adrenal Insufficiency due to Autoimmune disorder through Ayurveda.

Method

Available relevant Physiology texts books, Samhitas are referred to get an idea about the Adrenal gland and its various disorders as well as to plan a treatment protocol.

Results

Adrenal Insufficiency is a condition in which the Cortex does not make enough Steroid or Cortisol hormones. The AI can be classified into Primary and Secondary types². Primary AI is also called Addison's disease. Here the gland does not produce enough Cortisol hormones. For this reason AI is also called Hypocortisolism. The main cause for Primary AI is autoimmune diseases, in which the body's immune system attacks the body's own cells and tissues, resulting in inflammation and tissue damages. An Autoimmune disease is generally a Connective Tissue disorder. The other causes being TB of the Gland, genetic disorders, Surgical removal of the glands. Secondary AI can be due to Pituitary disorders such as infections, radiation damages etc: in which Pituitary is unable to release ACTH, administration of certain drugs such as Prednisone, Hydrocortisone etc:

Cortisol is necessary to keep the body from stressful situations. It also regulates BP, CVS functions, Increase protein catabolism, balance the effects of Insulin in breaking down the Glucose molecules, i.e., it promotes Gluconeogenesis and leads to hyperglycemia, Slows the Immune system or it has Immuno Suppressant effects, Anti – Inflammatory, Anti- allergic actions, stimulation of hematopoiesis, fat deposition over trunk, elimination of water load, production of feeling of well being, Reduction in circulating eosinophils, maintenance of capacity for muscular work. Glucocorticoids are generally used therapeutically for replacement therapy³. The Cortisol secretions are generally regulated by Pituitary gland and Hypothalamus. Failure to produce Cortisol in adequate level due to Primary and secondary causes can also lower the Aldosterone and Androgens levels.

Clinical features of AI⁴ : Fatigue, weakness, decreased appetite, weight loss, nausea, vomiting, diarrhea, Pain in muscle and joints, Low BP, Low Glucose level, Darkening of skin in hands, neck, face, irregular menstrual periods, decreased sex drive and so on.

Discussion: Here most of the Lakshana indicate *Vata Prakopa Lakshana*⁵ (symptoms of vitiated air) such as *Karshya* (loss of weight), *Kashnya* (blackish discoloration), *Gatra kampa* (body tremor) *Nidranaasa* (loss of sleep), *Bala nasa* (loss of strength), *Indriyopaghata* (functionless sense organs), *Asthisoola* (bony pain), *Bhaya* (fear and anxiety), *Soka* (depression) etc: and *Kapha Kshaya lakshana* (symptoms of decreased Kapha) such as *roukshya* (dryness), *Akshaglaani* (weak sense organs).

Since the whole Adrenal gland and Renals can be included under the term *Vrukka*, which being the *Moolasthan* (governing site or source) of *Medovaha Srotas* (channels that carry lipid or fatty tissues) and *Prabhava sthana* (source of origin) being *Kapha - Rakta*⁶. Then this particular region might be rich *Medodhatu* deposition, which is *Pruthvi – Jala Bhuyishta* and there will be *Kapha* predominancy in that area. As it is in lower abdominal area, *Apana vata*⁷ *vihaara* (travelling area of a type of Vata) also could be expected. Hence here the *Vata*, *Kapha* and the *Rakta dosha*⁸ together control the whole functions of *Vrukka*, its secretions, actions on target tissues, cellular functions and so on.

Nidana or factors that causes Adrenal Insufficiency : The *Nidana* such as⁹ *Dharana* (mentally and physically tiring), *Udeerana* (excess talk), *Nisa Jagarana* (sleepless nights), *Athyuchabhashana* (speaking loudly), *Kriya atiyoga* (excess work), *Soka* (depressive mood), *Chinta* (excessive thinking) etc: leads to *Vata prakopa* (vitiates Vata). Such factors also causes *Kapha* (decreases Kapha) and finally the *Dhatukshaya – the Medo dhatu Kshaya* (Fat tissue depots) or tissue damages. This inturn vitiates Vata in the particular site, causing Inflammations, insufficient production or secretion of Cortisol hormones, gradually leads to Autoimmune Adrenal Insufficiency.

Samprapti / Pathogenesis: The *Samprapti* can be clearly explain with the concept of *Dhatupakavastha*¹⁰ (inflammation of tissues due to improper digestion). In normal states the function of *Agni* involve *Paka* (digestion), which brings the *Dosha* into normal state from its vitiated states called *Doshapaka*. Proper understanding of the concept of *Dhatupakavastha*, leads to the proper diagnosis of the disease. In *Dhatupaka*, which occurs due to *Dosha vikriti* (alterations from normal state), there will be temporary or permanent damage of *Dhatu* or tissues in the body. During this process, *Agni* (digestive activities) also plays a major role. When the *Paka karma* (digestive action) of *Agni* get adversely affected, it brings deterioration or destruction of particular *Dhatu* and increases the strength of diseases. Such destruction can be either in *Sushka* (dry) form or in *Ardra* (moist) form. In *Sushka* form, the fluids surrounding a particular *Dhatu* will get evaporated due to *Vata-Pitta* predominancy, while in the *Ardra* form excess production of fluids takesplace due to *Pitta-Kapha* predominancy, leading to *Sopha* (oedema), *Vidradhi* (abcess), *Vruna* (wound with pus or bleeding). In *Sushka Pakavastha*, the *Dhatu* will be unable to function properly due to cellular death. If one particular *dhatu* get affected by *Dhatupakavastha*, then slowly it's ill effects get manifested and spread to other *Dhatu* level also. Hence *Dhatupakavastha* will be fatal if not treated in time. Few *Lakshana* or symptoms that indicate *Dhatupakavastha* are *Nidranasha* (loss of sleep), *Hrudi sthambha* (slowing heart rate), *Vishtambha* (loss of movements), *Gourava* (feeling of heaviness), *Aruchi* (loss of taste or appetite), *Arathir* (feeling of restlessness), *Balahaani* (loss of strength or fatigue) and so on.

In Autoimmune Adrenal Insufficiency, due to various *Vata Prakopa Karana*, *Karshya* (loss of weight), *Kashnya* (blackish discolouration), *Indriyopaghata* (functionless sense organs), *Gatra kampa* (body tremor), *Stabdha poorna koshtata* (distension or fullness of abdomen) etc: features¹¹ get manifested in the initial *Kriyakala* (stages of disease manifestation). If the patient is not getting proper diagnosis and treatment during this period, it leads to further stages of *Kriyakala* where there is *Dosha-Dushya Sammurchana*¹² (interaction between *Dosha-Dushya*) takesplace [fifth *kriyakala*]. In the final stages of diseases, during the fifth *Kriyakala*, the *Dhatupakavastha* occurs. Here the *Dhatu* will be unable to function properly due to cellular death and Inflammations, producing Auto immune disorders. Gradually *Lakshana* or clinical features of *Oja kshaya*¹³ (less immunity), *Medo dushti*¹⁴, *Vata prakopa*² and *Dhatupakavastha*¹¹ appears.

- ▶ Initially *Rasadhatu kshaya*¹⁵ (decreased first *dhatu*) occurs which causes the features such as *Krisangata* (loss of weight) or *Sosha* (emaciation), *Aruchi* (loss of taste or appetite or nausea, vomiting) and so on. Later the *Rakta Dhatu Kshaya*¹⁶ (decreased second *Dhatu*) occurs causing Hyperpigmentations on skin, low BP, Low plasma Glucose level. Gradually, the *Mamsa dhatu*¹⁶ *kshaya* (decreased third *dhatu*) leads to Muscle weakness. Finally *Medodhatu kshaya*¹⁶ (decreased 4th *dhatu*) occurs such as *Srama* (fatigue), *Angaroushyata* (skin dryness), *Sosha* (emaciation), where there will be complete distortion or dearrangements of almost all systems in the body. The reduced level of both Cortisol and Androgen can contribute to lower bone mineral density, which might be the reason for getting pain in bones and muscles causing Osteoporosis (*Asti dhatu Kshaya*)¹⁶. The *Kshaya* (decrease) of *Sukradhatu* (last *dhatu*) can be assumed from the lower value of serum Androgen and decreased sex drive and Irregular menstrual periods.

Diagnosis¹⁷: For proper treatment, a proper diagnosis is necessary. If we are suspecting AI, then, it is very essential to take

- I. Medical History
- II. Note down presenting signs and symptoms
- III. Serum Cortisol
- IV. Urinary Cortisol
- V. Blood level Na, K,
- VI. Secretory activity of Adrenal Cortex
- VII. Thyroid Function test

VIII. ACTH Stimulation test

IX. Insulin Induced Hypoglycemia test

X. Imaging tests – CT, MRI

Normal levels¹⁷

5-25µg/dl in early morning (highest concentration)

Level falls to **2-8µg** in the evening

Falls further to **5µg** at midnight

The blood tests can measure antibodies, associated with Autoimmune Addison's disease. ACTH – Stimulation test¹⁸, measures the level of Cortisol in blood. Here after the administration of synthetic ACTH of 250µg, Intramuscularly, the Serum Cortisol is tested at 30 minutes and 60 minutes. If the value is less than 3µg/dl in the early morning, the adrenals might be damaged and there will be minimum secretion of Cortisol in response to stress or in conditions where there is increased hormone requirement, even after the administration of ACTH. If the level is greater than 20µg/dl, impairment of adrenal reserve could be excluded.

Insulin –Induced Hypoglycemia test¹⁸ is often suggested to rule out whether AI is due to Pituitary disorder or Hypothalamus. This test involves checking Blood sugar and Cortisol level at various intervals after an injection of Insulin. In Healthy individuals, Glucose levels fall and Cortisol level increases.

If Serum Sodium¹⁸ is less than 135mEq/L, Serum Potassium greater than 5mEq/L, FBS less than 50 mg/dl, Plasma HCO₃ less than 20mEq/L, this suggests Addison's disease. Secretory activity of Adrenal cortex can be determined Isotopically. [Normal range : 280-840 µ mol / 24 hour].

Urinary Cortisol¹⁸ – is a very sensitive test. Here the level of free Cortisol excreted in urine depends on the plasma level of unbound Cortisol. [normal range: 20-70µg in 24 hours].

Serum Cortisol¹⁸ – It is carried out through RIA technique. Level will be highest in the early morning and then decline over a period of time and become lowest level in the late night. This circadian variability of normal Cortisol value is useful in the diagnosis of states of Cortisol excess.

Treatments: From various Clinical features it is clear that in AI there is Vatakopa and Kaphakshaya lakshana. So treatments can be planned to alleviate the vitiated Vata and to maintain the Kapha kshaya. Since there is almost all Dhatu Kshaya, usage of Brimhana dravya will enable to gain weight by the replacement of depleted tissues.

- a. Agni Deepana can be included in the initial stages in order to correct the Dhatwagni dushti.
- b. Brimhana chikitsa – for regulating VataPrakopa and KaphaKshaya with Madhura rasa dravya such as Yashtimadhu, with Tiktarasa such as Aswagandha, Ksheerabala etc:
- c. Use of Rasayana oushadi.
- d. Yogasana, Pranayama to keep both mind and body relaxed.
- e. Avoid stressful activities.
- f. Give adequate rest and sleep to the body.
- g. Intake of necessary nutrients rich food.

Differential Diagnosis¹⁸: ACTH receptor reflex, HIV, Adrenal TB, Adrenoleukodystrophy, Infectious adrenalitis, Adrenal Hypoplasia, Trauma, Hypopituitarism.

When to seek medical advice: If severe fatigue, Unintentional loss of weight, fainting, skin pigmentations, abdominal pain, etc: persists for several months, then a medical advice should be taken in order to rule out the actual conditions.

Conclusion

- ▶ From the various actions of Adrenal cortex, it is clear that most of its functions are initiated by Vata

ie.. *Vata* is the major factor that makes the particular organ and its hormones to function properly as well as to act on the target tissues . Since *Vrukka* is originated from *Kapha* and *Raktha* , such *Dosha and Dhātu kshaya lakshana* , along with *Vata prakopa lakshana* in most cases of Adrenal Insufficiency . Depends upon the symptoms , *Kriyakala* has to be assumed . Based upon the *Kriyakala* and *Nidana* , proper treatments can be planned such as *Brimhana chikitsa* .This will bring the vitiated *Vata* under control and regulate the *Kapha-raktha kshaya* conditions , back to normalcy. Though the condition is *Asadhya* – Symptomatic relief will be attained.

Reference

1. John E Hall, Arthur C Guyton , Guyton & Hall Textbook of Medical Physiology, Introduction to Endocrinology: 12e [Vishal]; Philadelphia, Pa:Saunders/Elsevier, 1701
2. Christopher Haslett, Edwin R. Chilvers et.al, Davidson's Principles and practice of Medicine; Endocrinedisease,20; British Library Cataloguing in Publication data;2002:776
3. KV Krishna D, Textbook of Medicine; Endocrinology:11, jaypee Brothers medical publishers; 5th e ; 2000 : 650
4. Christopher Haslett, Edwin R.Chilvers et.al, Davidson's Principles and practice of Medicine; Endocrinedisease,20; British Library Cataloguing in Publication data:2002:776
5. R.B. Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshadivinjaneeeyam:19,3. Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:285
6. M.K.R. Srikantha. SusrutaSamhita of Susruta. Sareerasthana; Doshadhatu mala kshayavidhivinjanam: 4,32. Varanasi: Chowkambha Orientalia, 2012:60
7. R.B. Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshbhedeeeyam:20.2 Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:299
8. M.K.R. Srikantha. Susruta Samhita of Susruta. Sootrasthana; Vruna Prasnamadhyayam:21. 3,4. Varanasi: Chowkambha Orientalia,2012:242
9. P. M. Govindan Vaidyan.Vagbhata's Astangaridaya Nidanasthana; C Chapter:1.14,15. Devi bookstall Kodungalloor.11 reprint.2005:18
10. Dr.C.R. Agnivesh. Rogi vijaanam and Vikritivijaanam of Sas Ranade, G.R. Parajape, Vyadhyavasta:7.On behalf of Govt.of Kerala. Santhosh Printers,Tvm:125,126
11. R.B. Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshadivinjaneeeyam:19,7. Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:286
12. M.K.R. Srikantha. Susruta Samhita of Susruta. Sootrasthana; 21,33.Varanasi: Chowkambha Orientalia,2012:257
13. R.B. Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshadivinjaneeeyam:19. Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:286
14. Vaidya Jadavji Trikamji Acharya,Charaka Samhita of Agnivesa,Revised by Charaka and Dritabala with Ayurveda Deepika Commentary of Chakrapaanidatta; Srotovimanam;5,7. Varanasi: Chowkambha publications,2004:250
15. R.B.Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshadivinjaneeeyam:19. Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:288
16. R.B.Rama. Ashtangasangraha of Vagbhata. Sootrashana; Doshadivinjaneeeyam:19. Varanasi: Chowkambha Vishwabharati oriental publishers, 2006:288
17. KV Krishna D, Textbook of Medicine; Endocrinology:11, Jaypee Brothers medical publishers; 5th e ; 2000 : 653
18. <https://online.epocrates.com/diseases/5635/addison> disease/Differential diagnosis