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# Clinico-anatomical Approach of Medovaha Srotas with special reference to Sthaulya/ Obesity & its Management

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## ABSTRACT

The human body is a conglomeration of the *Srotas*. Holistic science of Ayurveda is based on Doshas, Ddhatu, Oja, Agni and Srotas etc. Srotas are the micro channels of the body which provide platform for activities of Tridosh, Dhatu, Oja, Agni etc. In Ayurvedic classics the term Srotas is used as all the macro and micro channels and pathways operating in the living organism. One of them are *Medovaha Srotas*. The distribution of adipose cells in human body is prevalent in subcutaneous tissue, omentum, kidney, skeletal muscles, liver and this reconfirms the *Moolasthanas* of *Medovaha Srotas* (*Vrikka, Vapavahan, Kati*) described by *Charak* and *Shushruta*. The vitiation of this Srotas can lead to *Sthaulya* /obesity, *Prameh* etc.

Obesity can be defined as an excess deposition of body fat. The fat in the adipose tissue is derived from two main sources that is from food fat, carbohydrate & protein. Adipose cells are actually responsible for converting carbohydrate into fat. The excessive intake of fatty food, sedentary lifestyle, neuro-hormonal abnormality and genetic predisposition are leading causes of Obesity. It is the risk factor for many diseases like diabetes, CVA, hypertension, etc. In present scenario treatment of lifestyle disorder like obesity with modern system of medicine alone are not properly. *Ayurvedic Science "Swasthaya Swasthya Rakshnam"* like *Dincharya, Ritucharya* etc. has great potential in preventing and treating life style disorders like obesity on the basis of description is mentioned in *Ayurveda* classics

**Key Words** *Medovaha Srotas, Medoroga, Obesity, Sthaulya*

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## INTRODUCTION

According to *Ayurveda* texts- "*Api Cha Eke Srotosameba Samudayam Purushamichanti*"<sup>1</sup>.

Human body is made up by the union of *Srotas* groups which are designed as inner transport



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system of biological substances and help to maintain normal physiology.

“*Yawantah Purushe Murtimanto Bhavavisheshah Tavantevasmin Srotasam Prakara Visheshah*”<sup>2</sup>. It means that *Srotas* is used as a generic term indicating all the macro and micro channels and pathways were operating in the living organism. *Acharya Charka* has defined it as “*Sravnata Srotamsi*”<sup>3</sup>, means the structure from which *Sravan* occurs in different systems comprised of innumerable channels which are designed as inner transport system for divergent functions. *Chakrapani* has defined *Srotas* as - “*Sravnatsrotansi*”. Which can be interpreted as *Sravan* (secretion) of *Rasadi Dhatus*<sup>4</sup>. The *Srotas* provides nutrition to different tissues that secreted or transported. These consist of both gross channels, such as different systems of the body and their pathways, as well as the more subtle channels, such as the capillaries.

The study of *Srotas* is very necessary because it is responsible for carrying & transformation of tissue elements there by maintaining the health. These channels carry *Prana*, *Uadaka*, *Anna*, *Meda* etc. From the above mentioned *Srotas Medovaha Srotas* has its unique features. *Ayurveda* has given prime importance to *Medovaha Srotas* and its diseases. *Medadhatu* is the predominant *Dushya* in most of the *Santarpanajanya Vyadhi* like *Prameha* and *Sthaulya* etc. and there is high prevalence of these diseases in developed as well as developing countries in the present time. Every

*Srotas* has its *Srotomula* and *Srotomarg*. The *Moolasthan* of *Medovaha Srotas* are *Vrikka*, *Vapavahan* and *Kati*.

### **NIRUKTI:-**

The word *Srotas* is derived from Sanskrit root “*SRU GATAU*” *Dhatu*. The term *Srotas* means secreting, filtering, flowing, moving, oozing etc.

### **SROTAS PARYAY [SYNONYMS] :-**

*Acharya Charak* has mentioned the synonyms of *Srotas* are *Srotansi*, *Sira*, *Dhamani*, *Rasayani*, *Rasavahini*, *Nadi*, *Panth*, *Marga*, *Shariracchidra*, *Samvrit*, *Asamvrita*, *Sthana*, *Ashaya* and *Niketa*<sup>5</sup>.

*Acharya Vagabhatt* has described synonym of *Srotas* in *Ashtang Samgrah Sharir Sthan* 6th chapter. These are *Srotansi*, *Sira*, *Dhamani*, *Rasavahini*, *Nadi*, *Panth*, *Ayna*, *Marga*, *Shariracchidra*, *Samvrit*, *Asamvrita*, *Sthana*, *Ashyaya* and *Niketa*<sup>6</sup>.

In *Sanskrit Hindi Sabdarthkosh*, several synonyms of *Srotas* are available which are *Nadi*, *Dhara*, *Sarita*, *Leher*, *Jal*, *Randhra* and *Poshannalika*.

### **SROTAS AAKRATI:-<sup>7</sup>**

**Colour-** According to *Acharya Charak*, *Srotas* have their color similar to that *Dhatu* which transported through it.

**Size-** *Anu* (Microscopic), *Sthula* (Macroscopic)

**Shape-** *Vritta* (Cylindrical), *Dirgha* (Long), *Pratana* (Reticulated)

**SROTAS BHED [TYPES]:-** Different texts of *Ayurveda* classified *Srotas* as (Table no.-1)



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Table 1 Classification of Srotas as per Ayurveda

Acharya Charak <sup>8</sup>	Acharya Sushrut	AsthangHri daya <sup>9</sup>	Sharangdhar <sup>10</sup>	Kashyap <sup>11</sup>
1. <i>Pranavahasrotas</i>	<i>Bahirmukhsrotas</i> <sup>12</sup>	<i>AntarmukhaSrotas</i>	<b>1.Bahirmukhsrotas</b> – 9	<b>1.Mahat</b> – 9
2. <i>Udakvahasrotas</i>		<i>/YogyahiSrotas-11</i>	in male and	In males and
3. <i>Annavahasrotas</i>		pairs <sup>13</sup>	12 in female	12 in female
4. <i>Rasavahasrotas</i>	<b>9 in male and 12 in</b>	1. <i>Pranavahasrotas</i>	same as	same as
5. <i>Raktavahasrotas</i>	<b>female, they are –</b>	2. <i>Udakvahasrotas</i>	Maharishi	Bahirmukhsr
6. <i>Manshavahasrotas</i>	1. <i>Netra-2</i>	3. <i>Annavahasrotas</i>	Sushrut	otas of
7. <i>Medovahasrotas</i>	2. <i>Karana-2</i>	4. <i>Rasavahasrotas</i>	& female	Sushrut
8. <i>Asthivahasrotas</i>	3. <i>Nasika-2</i>	5. <i>Raktavahasrotas</i>	named as	2. <i>SukshmaN</i>
9. <i>Majjavahasrotas</i>	4. <i>Mukha – 1</i>	6. <i>Manshavahasrotas</i>	<b>Brahmrndh.</b>	<i>abhi and</i>
10. <i>Shukravaashrotas</i>	5. <i>Guda-1</i>	7. <i>Medovahasrotas</i>	<b>Srotas13</b> -	<i>Romkoop</i>
11. <i>Mutravahasrotas</i>	6. <i>Mutramarg-1and 3</i>	8. <i>Shukravahasrotas</i>	same as	
12. <i>Purishvahasrotas</i>	<b>extra12 in females</b>	9. <i>Mutravahasrotas</i>	Acharya	
13. <i>Swedavahasrotas</i>	7. <i>Stanya-2</i>	10. <i>Purishvahasrotas</i>	Charak	
	8. <i>Apatyamarg -1.</i>	11. <i>Aartavvhasrotas</i>		

Acharya Charak has also described *Manovaha Srotas* in different references.

**MEDOVAHA SROTAS:-**

*Medovaha Srotas* perform an important anatomical and physiological role in the body. All three treatise *Samhitas of Ayurveda* are considered as *Medovaha Srotas*. These *Samhitas* also describe their *Moolas, Dushti Hetu and Chikitsa*. In present scenario diseases of *Medovaha Srotas* play a major role in non communicable diseases *Ex-Ashtanindit Purus Prameha* etc. From *Ayurveda* point of view, there is a lack of proper knowledge about *Medovaha Srotas*, So an attempt is made to clear the concept of *Medovaha Srotas* and its diseases management.

**MoolSthanofMedovahSrotas:-**

According to Maharishi *Sushrut*<sup>14</sup>- *Kati and Vrikka*

According to Acharya *Charak* – *Vrikka and Vapavahan*

*Kati* (hip region) and *Vapavhan* (greater omentum) are the main site of *Medovridhhi, Vrikka* (kidneys) are made from *Rakta-meda Prasadbhag* according to *Ayurveda* it performs major role in fat metabolism.

The kidney is bilateral retroperitoneal organ situated one on either side of the vertebral column and surrounded by a capsule that is fatty tissue. The kidney and its vessels are encased by a mass of fatty tissue, known as renal fascia, behind the renal fascia is considerable quality of fat which constitutes the para-nephric body<sup>15</sup>.

**Medovaha Srotas Dushti Hetu [Causes]:-**

**Samanya Hetu**<sup>16</sup>- According to Acharya *Charak-Ahar Vihar* similar to *Doshas* and opposite to *Dhatu* are responsible for *Srotodushti*. It means they cause vitiation of *Doshas* and disturb the functions of *Dhatu*s.

**Vishesh Hetu**<sup>17</sup>- According to Acharya *Charak-Avyayam* (lack of exercise) , *Divashwapan* (excessive sleeping in day time) , Eating of



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excessive fatty diet, *Varuniatisevan* (excessive intake of alcohol) are main causative factors of *Medovaha Srotodushti*.

### **SAMANYA DUSTHI LAKSHAN:** -

**Samanya Lakshan**<sup>18</sup> - *Acharya Charak* describes 4 main symptoms of *Srotodushti*. These are – *Atipravatti*, *Sang*, *Siragranthi* and *Vimarggaman*.

### **Vishesh Lakshan**<sup>19</sup> -

**Maharishi Sushrut** has described *Medo Dhatu Vidhaya Lakshan*. They are *Swedagaman* (excessive sweating), *Snigdhangta* (oily skin or fatty organ), *Talushosh* (dryness of throat), *Sthul* (obesity), *Soph* (Oedema) and *Pipasha* (excessive thirst).

**Acharya Charak**<sup>20</sup> - also describes main disorder of *Medo prdosajvikar* known as *Asthnindit Purusha*. They are – *Atideergh* (excessive tallness), *Atihrashva* (dwarf), *Atiloma* (excessive body hair growth), *Aloma* (lack of body hairs), *Atikrishna* (extremely dark skin), *Atigaur* (extremely fair), *Atishthul* (excessively obesity), *Atikrash* (Excessive lean and thin or extremely underweight).

**Atideergh (excessive tallness)** :- This is just like to gigantism, a disorder of pituitary gland and due to rapidly growth of cells it is more prone to cancer. This condition is also related to bones & Hormonal imbalance.

**Atihrashva (dwarfism)**:- Extremely Shortened height just like to dwarfism.

**Atiloma (excessive body hair growth)** :- This is mostly closely to Hirsutism. It commonly occurs due to over production of male hormone.

**Aloma (lack of body hairs)**:- This condition is compared with Eunuchoidism. It is characterized by lack of development of sex organ.

**Atikrishna (extremely dark skin)**:- Dark complexion is a condition which is concerned with pigmentation and Addison Disease. It is the condition of primary insufficiency of adrenal hormone.

**Atigaur (extremely fair)**:- Fair complexion is a condition of hypo pigmentation.

**Atikrash (Excessive lean and thin or extremely underweight)**:- It is condition related to starvation or malnutrition. This condition is also seen in pituitary Cachexia or weakness or wasting of body.

**Atishthul (obesity)** :-In present world, due to sedentary lifestyle, faulty dietary habits including consumption of fast food are the main causes of many diseases. *Sthaulya* (Obesity) is one of these disease which has affected the whole generations health. Obesity is emerging health issue now a day in India and globally.

“*Sthaulya*” (obesity) give platform for many diseases like hypertension, ischemic heart disease, diabetes, osteoarthritis, infertility, and impotency as well as psychological disorders like distress, anxiety and depression etc.

In Ayurveda texts, the description of *Sthaulya* has described vividly. *Acharya Charaka* has described *Atisthoolpurusha* in reference to “*AshtaNinditPurusha*” (eight despicable personalities) and *Samtarpanajanita Roga*. *Sthaulya* is counted as a disorder of *Shleshmaj Vikar* seated in *Medodhatu*. *Ati Sthula* can be



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defined as a person, "who on account of the inordinate increase of fat and flesh, disfigured with pendulous buttocks, belly and breasts and whose increased bulk is not matched by a corresponding increase in energy<sup>21</sup>.

### **Etiopathogenesis<sup>22</sup> -**

*Acharaya Charak* has described the hereditary component (*Bijadosha*)<sup>23</sup> along with *Aharatmaka*, *Viharatmaka* and *Manasika* factors in procreation of this disease.

*Atisampurna* (excessive eating), *Sheeta*, *Guru Snigdha ahaar Sevana* (Excessive consumption of cold, heavy, sweet, unctuous food) , *Avayam* (Lack of physical exercise), *Avayava* (Lack of sexual performance), *Divaswapana* (sleeping in day time), *Achintanat* (luxurious life) are some of the etiological factors of the disease<sup>24</sup>. Thus, it is clear that both the endogenous and exogenous factors are responsible for the disease. *Sthaulya* is a *Dushya* dominant disorder of *Meda*, and all three *Doshas* are vitiated, especially *Kledaka Kapha*, *Pachaka Pitta*, *Samana* and *VyanaVayu*. *Acharaya Charak* and *Sushrut* have different opinion regarding the pathogenesis of this disease. *Charak* has emphasized 'Ahara and Nidra' as most common pathogenic factor for *Medovridhhi* in *Sthaulya*. *Sushruta* has accepted the concept of 'Amadosha or ras.'

The various *Kaphavardhak* etiological factors lead to formation of undigested *Madhura Ama Rasa*. This *Madhura Rasa* while circulating in body contributes to the excessive *Meda* formation due to *Atisnigdha Guna*. This accumulation of *Meda* results in *Atisthoolta*, as outlined by

*Sushruta*. *Medo Vridhi* which leads to obstruction of *Srotas*, the *Vata* moving mainly into stomach, fires up the *Jatharagni* and absorbs the food. The obese person digests foods speedily and craves for more food inordinately. Over eating produces more *Upadana Rasa* which causes over growth of *Medo Dhatu*, thus leads to *Sthulata*<sup>25</sup>.

### **Symptoms of the disease<sup>26</sup> :-**

1. *Ayushohrasa* (Decrease life span)
2. *Javoparodha* (Lack of energy for work)
3. *Kricchavyavaya* (Difficulty in sexual activity)
4. *Daurbalya* (Weakness)
5. *Daurgandhya* (Foul smelling of body)
6. *Swedabaddha* (Excessive sweating)
7. *Kshudhatimatra* (Excessive hunger)
8. *Pipasatiyoya* (Excessive thirst)

### **Chikitsa Sidhant<sup>27</sup> :-**

**Nidanparivarjan<sup>28</sup>-** *Nidanparivarjan* is the first and main step of treatment of diseases. Avoid causative factors like *Aharaj* and *Viharaj* which are responsible for *Sthaulya* and perform regular *Vyayam* in daily routine with *Karshna*, *Guru Aptarpan Chikitsa*.

**Sansodhan Chikitsa-**Use of *Panchkarma* procedure such as *Vaman*, *Virechan*, *Lekhan Vasti*, *Abhyang* etc.

**SanshmanChikitsa-**Use of proper anti obesity drugs as mentioned in various texts of *Ayurveda* such as *Guggul* preparations.

**CLASSIFICATION-** Obese persons are divided in 3 categories—*Ati*, *Madhyama* and *Hina* for easy diagnosis and management.

### **Obesity -**

### **Etymology**





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Obesity is derived from the Latin word – “obesitas” which means “stout, fat or plump”.

### Definition

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A body mass index (BMI) over 25 is considered overweight, and over 30 is obese.

### Etiological Factors

Age – obesity is most prevalent in middle age.

Socio- economic status-in developed countries obesity is more common in the lower socioeconomic group.

Over eating – diets largely derived from carbohydrates and fats.

Lack of physical activities.

Hereditary predisposition or idiopathic or genetic obesity.

### Endocrinal factors of obesity-

Pituitary adiposity.

Pregnancy.

After menopause.

Hypothyroidism.

Cushing’s syndrome.

**Table 2** Classification of adults according to BMI<sup>29</sup>

Classification	BMI	Risk of co morbidities
Underweight	<18.50	Low (but risk of other clinical problems increased)
Normal range	18.50-24.99	Average
Overweight		
Pre-obese	25.00-29.99	Increased
Obese class I	30.00-34.99	Moderate.
Obese class II	35.00-39.99	Severe
Obese class III	≥ 40.00	Very severe

**Broca index:-** for ideal weight.

= Height (centimeter) – 100

ex:= 162-100= 62kg

Energy balance – a very small excess of calories if habitual can lead eventually to a large amount of fat.

### Systemic Effects of Obesity

**Cardiovascular system** – CAD, hypertension, varicose veins, pedal edema.

**Brain-** CVA, mental disturbances.

**Respiratory system-** breathlessness.

**Gastrointestinal system-** hiatus hernia, gall bladder disease, constipation.

**Joints-** osteoarthritis, backache

**Pregnancy-** neural tube defect, peri-natal mortality, preeclampsia, gestational diabetes, preterm Parturition, deep vein thrombosis.

**Endocrine and metabolic-** non insulin dependent diabetes mellitus, hyperlipidemia, hirsutism, menstrual irregularities, menorrhagia, impotence.

**Skin-dermal** and sweat, rashes.

### Assessment of Obesity

BMI- the most widely used method to categorized obesity as mentioned in table no.2

BMI = weight in kg/ height in meter square

**Skin fold thickness-** a large proportion of total body fat is located hypodermal. Since it is accessible, the method most used is the



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measurement of skinfold thickness. It is a rapid and “non invasive” method for assessing body fat.

**Waist circumference** - waist circumference is measured at the midpoint between the lower border of the rib cage and the iliac crest. More than 102 centimeter in male and 88 centimeter. In female is risky.

### **Waist hip ratio (WHR)**

Over the past 10 years or so, it has become accepted that a high WHR (> 1.0 in MEN and > 0.85 in women) indicates abdominal fat accumulation.

**Other methods**- more accurate measurement are used for the estimation of body fat. They are- total body water, of total potassium and body density.

### **Management: Principles**

**Exercise**:- It is very useful to treat obesity extra calories should be burnt with exercise unless there is medical contraindication

**Diet**:- Long term results are best where patients are well motivated and educated. Use of appetite suppressants, reduction in dietary fat absorption. Use of bulk agents, Physiotherapy, starvation, surgical procedure<sup>30,31,32</sup>.

## CONCLUSION

A tree is seriously affected by injury to its root resulting in an injured or a dead tree. As similar to this example when srotasmoola are vitiated by *Dosha* they will lead *Srotas Dusthi Lakshan* & its diseases. *Moolasthan* of *Medovaha Srotasis Vrikka, Vapavahan, Kati*, described by *Charak* and *Sushruta*. According to

modern science, adipose tissue stored in kidney, omentum, liver & subcutaneous tissue of abdomen and flanks etc. So fat deposition is mainly occurs in this region. The site of fat deposition mentioned in *Ayurveda* texts and modern science are same. *Ayurvedic* anatomy is a living anatomy so, *Srotas* perform an major role either anatomically as well as physiologically. The disease of *Medovaha Srotas ex-Asthindit Purusis* similarly to hormonal disorder. Obesit, diabetes, hypertension are the main health issue now-a-days. So it is necessary to know about. *Medovaha Srotas* anatomy and its clinical importance. Management of *Srotas* is helpful to prevention and cure of diseases. Avoidance of physical and mental stress, will save people's money and nation which spent on treatments and preventions. Thus we can make strong socioeconomic status of peoples and nations and make happy, healthy environment. There are more chances of research in the field of clinical importance of *Medovaha Srotas*.



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REFERENCES

1. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.viman 5/3 Page no.709.
2. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.viman 5/4Page no.709.
3. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 30/12 Page no.709.
4. Ebook NIIMH INDIA E-charaksamhitachakrapanitika on ch.sutra 30/12
5. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.Vima 5/09 Page no.712.
6. AstangaHridayamVidyotinitika, Kaviraja Gupta Atrideva, 1st edition. Varanasi: ChaukhambhaPrakashan; 2016. Asthanghridayasharir 6/50 Page no.256
7. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.Vima 5/25 Page no.714.
8. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.Viman 5/6 Page no.710.
9. AstangaHridayamVidyotinitika, Kaviraja Gupta Atrideva, 1st edition. Varanasi: ChaukhambhaPrakashan; 2016. Vol. i, Asthanghridayasharir 3/40-41Page no.254
10. SharangdharSamitajeevanpradahinditika, chaukambhaorientalia edition 2017 Purvkhnad 5/44 page n. 42
11. Bradhhajeevaktantrahindividdhotanitika, PanditHemraj Sharma Varanasi Chaukhambha Sanskrit Sansthan edition 2009
12. SushrutaSamhita Ayurveda TattvaSandipika,ShastriAmbikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. sha.5/6 Page no.97.
13. SushrutaSamhita Ayurveda TattvaSandipika,ShastriAmbikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. sha. 9/12 Page no.55.
14. SushrutaSamhita Ayurveda TattvaSandipika,ShastriAmbikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. Sha. 5/6Page no.97.
15. Grey's clinical anatomy, Textbook of Anatomy , Hennery Grey international Publishers, 40th edition. 2015. Page no. 1221
16. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.Viman 5/23 Page no.714.
17. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch.Viman 5/16 Page no.713.
18. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi:





### ORIGINAL RESEARCH ARTICLE

- ChaukhambhaBharati Academy; 2008. Vol.i, ch.Viman 5/16 Page no.714.
19. SushrutaSamhita Ayurveda TattvaSandipika,ShastriAmbikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. sha.9/12Page no.55.
20. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/03 Page no.407.
21. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/09 Page no.411.
22. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/5-9 Page no.411.
23. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/04 Page no.409.
24. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/04 Page no.409.
25. Mdhavnidan,Madhukosh commentary ,Dr. BrahmanandaTripathi, edition 2005, ChaukhambhasurbharatiprakashanVaranashi,vol. 2, M.Ni. 34/2-5 page n.34,
26. CharakSamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: ChaukhambhaBharati Academy; 2008. Vol.i, ch. Sutra 21/04 Page no.409.
27. Charak SamhitaVidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: Chaukhambha Bharati Academy; 2008. Vol.i, ch. Sutra 21/16 Page no.412
28. SushrutaSamhita Ayurveda TattvaSandipika, ShastriAmbikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. 2<sup>nd</sup> , Su. uttar . 1/25 Page no.14.
29. Harrison's Principles of Internal Medicine,Dennis L. Kasper, Eugene Braunwald, Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson. 16<sup>th</sup> edition, volume 2, New York: McGraw Hill education, 2004 page-422
30. Text book of Physiology, Prof Jain A.K, 5th edition. Avichal Publishing Company; 2014.
31. Textbook of pathology,Harsh Mohan, The Health Sciences Publishers, 7th edition. 2015.
32. Harrison's Principles of Internal Medicine, Dennis L. Kasper, Eugene Braunwald, Anthony S. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson. 16<sup>th</sup> edition, volume 2, New York: McGraw Hill education, 2004.