



# ***A CONCEPTUAL STUDY OF RAKTASHAYA W.S.R. TO YAKRIT AND PLEEHA VIKRITI***

***Sonam<sup>1</sup> Satish Vats<sup>2</sup> Sachin Sharma<sup>3</sup>***

***<sup>1</sup>MD Scholar, PG Department of Rachna Sharir, Shri Krishna Government Ayurvedic College, Kurukshetra, Haryana.***

***<sup>2</sup> Professor and HOD, PG Department of Rachna Sharir, Shri Krishna Government Ayurvedic College, Kurukshetra, Haryana.***

***<sup>3</sup>Associate Professor, PG Department of Rachna Sharir, Shri Krishna Government Ayurvedic College, Kurukshetra, Haryana.***

**Abstract:-** Ayurveda is an ancient science of life. Science is the result of the curiosity of human being through which human beings has studied, analyzed, and come to the results of various natural processes occurring in the body. Today practically and scientifically the existence of everything has been proven. Ayurveda, being a part of this science also needs a deep study and research for Proving all the facts established by *Acharyas* in ancient times. The principles of *Ayurveda* are eternal. Every concept has its own importance. It should be understood with the help of references in different *Samhitas*. The meaning of the same word may differ in each *Samhita*. One of these is the concept of *ASHAYA* described in *Sushrut Samhita*. In the human body, various vital elements are Stored in hollow viscera called *Ashaya*. One of these is the concept of *ASHAYA* described in *Sushrut Samhita*. In this study, an attempt is made to explore the concept of *Raktashya* in *Sushrut Samhita* & various texts and interpret it anatomically & Clinically.

**Key words :-** *Raktashaya, sharir, saptadhatu, Rakt, Yakrit, Pleeha, Raktvahasrotas*

**Aim:-**

- To Study on *Raktashaya*
- To Study on *Yakrit & Pleeha* from *Ayurvedic* and modern science point of View.

## Objective:-

- Study of *Yakrit* & *pleeha* With respect to *Raktashaya*
- Detail study of *Yakrit* & *pleeha* with definition, description, location & its Importance.
- Treatment of *Yakrutroga* & *pleeharoga* .

**Materials & methods-** The study is conducted in 2 levels

**Level 1-** Study *Raktashaya*, *Rakta*, *Raktavahasrotas*, *Yakrit* & *Pleeha* from Ayurved textbooks modern textbooks, published Journals & Internet etc.

**Level 2** Cadaveric study –Dissection of *yakrit* (liver) & *pleeha*.

**Introduction:-** *Sushruta Samhita* is best in *Sharirasthan*. Acharya *Sushruta* mentions *Saptadhatu* which are the basic elements of the body. Performing some Specific functions in the body for Example- *Rasadhatu* has *prinana* Means the function of nourishment. *Rakta* has *jivanam* i.e. maintenance of life. Acharya *Sushruta* assumes *Rakta* as a life in its basic concepts. Acharya *Sushruta* has mentioned *seven* layers of skin, *seven Kalan* *seven Ashaya*, *seven Dhatu*, and *seven siras*. These are *seven* and in which *Raktashya* will be done <sup>1</sup>. In the human body, various vital elements are stored in hollow viscera called as *Ashaya* which is very important for life. *Shonitasya sthaanam yakrut pleehaanu* <sup>2</sup> *jeeva Raktashya itu jeeva.*” The *Raktashya* is located in the *yakrit* (liver) and *pleeha* (spleen). They are called *Raktashya* because they are hemopoietic organs taking part in the formation and maturation of blood cells. The responsibility is greater on them when the child is in the mother’s womb. Later the responsibility is transferred to the bone marrow but the liver and spleen will have their hold and effect on the process throughout the life as per *ayurvedic* references. Therefore they are called *Raktashya*. They carry memories of blood production. The *Pleeha* or spleen located towards the left of *hrudya* is the site of *Jeeva rakta* (blood which is in the form of life )<sup>3</sup>. In *Ayurveda*, *Yakrit* is considered as one of the organs situated in *koshta*. The origin of word “*yakrut*” is from the root of “*yakan*” which means the liver. *Yakrit* is the constitution of two words “*ya* means activity”, *krit* means “breakdown”. *Yakrit* is also used as a synonym for the word “restoration”. The word *yakrit* is defined as “*yan samyaman karoti itu yakrut*” by *Sabdastomahanidhi* which means to have control over “. *Yakrit* is one of the *koshtanga* and is considered the seat of *Ranjaka pitta*. It is situated on the right side of the *udara* (abdomen) below the *hridaya*. *Sushruta* considered *yakrit* as originating from the *rakta* and is maternal in origin<sup>4</sup>.

**Significance of *Yakrit* and *pleeha* as an organ:-** *Yakrit* and *pleeha* are considered to be the moola of *Raktavahasrotas* by *Charaka* <sup>5</sup>. *Sushruta* includes *Raktavahadhamni* also <sup>6</sup>. *Sarangadhara* in addition of *Raktadharakalan* has described *yakrit* and *plihadharakala*. Out of sixty-six *peshi* (muscles) found in the abdomen, six are situated in relation to the *Yakrit*, *Pleeha*, and *Unduka*. <sup>7</sup> *Sushruta* has described forty main *siras* out of which ten are *Raktavaha*, which are found to *Yakrit* and *pleeha* <sup>8</sup>. If vitiated *Rakta* flows through these *siras* it causes various blood-borne diseases. *Yakrit* and *pleeha* are the sited of *ranjakapitta* . It is also known as *ranjakagni* and it colours the *annarasa* produced after digestion, *Raktadhatu nirmana*. *Yakrit* is considered as sitr of *buthgnivyapara*, *malapitta nirmana*.

**Pleeha (spleen):-** *Pleeha* is produced by *sonita* (blood). It is situated/placed on the left side below the cardiac region (*vamatohrdayadayan*). Great sages recognize it as the root of the *siras*, circulating the blood (*Raktavahasrotas*). *Garbha* is produced by the mother as *matrija bhava*. The various organs etc. specifically produced as *matrija bhava* which originated from the blood of the mother and these *matrija bhava* include the liver and spleen <sup>9</sup>.

**Bheda Of Yakrit vikara:-** Based on *doshic* Involvement, *Yakrit Vikara* is classified into 4 types - *Vataja*, *Pittaja*, *Kaphaja*, *Raktaja* <sup>10</sup>.

**Nidana:-** *Vidahi aahara* i.e. *kulattha*, *masha*, *sarshapa Shaaka* etc. *Abhishyandi Aahara* is like the *dadhi* of *Maheesh Kshira*.

**Samprapti :-** *Nidana* (*vidahi & abhishyandi aahara*)- Increase of *rakta & kapha Yakrit vridhi Yakrit roga*.

Types	Lakshana
Vataja	Nityamanaddha koshta, Nityodavarta peedita Vedanabhi pareeta.
Pittaj	jwara, pipasa daha, moha Peetagraha,
Kaphaja	Manda vyatha, Sthoola, Kothing, Gourgyo, Arochaka,
Raktaja	klama, Bhrama, Vidaha, Vaivarnya, Gatra, Gourava, Moha, Raktodara.

**Yakrdalyudara:-**

**Nidana:-** *Udara* is said to be caused by factors such as intake Of excessive *usna*, *ksara*, *vidahi*, *amla* food, improper *Samsrajana karma*, intake of ununctuous, *viruddhahara*, Emaciation as a consequence of diseases like *Pliharoga*, *Arsas*, and *Grahani*, improper administration of *Panchakarma* therapy, suppression of natural urges, vitiation Of the channels of circulation, continued presence of *ama* in The body, intake of irritating foods and drinks, over nutrition.

**Signs and Symptoms:-** it is one of the *Udara roga*, which is Having enlargement of the *Udara*. *Ayurvedic* texts have described details of *plihodar*, on the basis of that *Yakrdalyudara* can be said to have the following general Symptoms: *daurbalya*, *arochaka*, *avipaka*, *varcograha*, *Mutragraha*, *pipasa*, *angamarda*, *angasada*, *kasa*, *svasa*, *Mrdu jvara*, *anaha*, *karsya*, *agninasha*, *parvabheda*, *Asyavairasya*, pain in the *kostha* due to *vata*, *tamahpravesha*. *Charaka* mentions appearing of *nila*, *harita*, and *haridra* coloured Lines on the abdomen, colour of the abdomen may change to *Arunavarna*, with generalized severe pale discoloration.

<i>Types</i>	<i>Lakshana</i>
<i>Vataja</i>	<i>Yakrdalyudara</i> : udavarta, ruja and anaha
<i>Pittaja</i>	<i>Yakrdalyudara</i> : jvara, moha, trishna and daha
<i>Kaphaja</i>	<i>Yakrdalyudara</i> : gaurava, aruci, kathina.

**Bheda of pleeha vikara:-**five types of disorders of spleen – *vata,pitta,kapha,sannipata, Rakta*.

### **Etiopathogenesis, Characters of pleeha, and clinical features of plihodara (splenomegaly):-**

**Etiopathogenesis** - The person who after ingesting food rides a jerking vehicle or conveyance, does excessive physical activity, indulges excessively in sex, carries overweight,walks on foot for a long distance,and also had emaciation due to excessive use of emesis or due to any other disease, *pleeha* is located in the left side of abdomen gets displaced from its normal space and is thus enlarged. It also gets enlarged due to the increase of blood as a consequence of the increase of *rasa* <sup>11</sup>.

**Characters of enlarged Pleeha**-The enlarged *Pleeha* is hard in the beginning like *asthila* or painless, gradually increases and becomes like a tortoise (hard, smooth center, protuberant sloping toward periphery). If neglected it (increases) gradually covers the (*kuksi* ) belly and *Jathara* (abdomen) the seat of digestive fire, thus producing *udara roga* ( abdominal disorder) <sup>12</sup>.

**Clinical features of Plihodara (Splenomegaly):-** It's clinical features are; Debility, dislike for food, indigestion, retention or suppression of feces and urine feeling as if entering into dark ( due to fainting) polydipsia, body ache, vomiting, swoon, lassitude, cough,dyspnoea, mild fever, *anaha* (abdominal distension with constipation), diminution of digestive fire, emaciation, insipidity, arthralgia or pain in phalangeal joints, abdominal gases and pain in abdomen are the symptoms. The abdomen appears reddish or of abnormal colour, with blue, green, or deep yellow streaks <sup>13</sup>.

Enlargement of the spleen is due to two factors i.e. 1- displacement from its physiological location caused by agitation or irritation.

2- due to the increase of blood the features of the *pleeha* situated on the left side of the abdomen are described. Due to the increase of *rasa* and blood also increased.

**Splenomegaly** -When aggravated *vata* elevating the spleen gets located there and produces gradually mild pain in the flank, then the spleen gets enlarged <sup>14</sup>.

**Pleeha Roga Types: -**

<b>Raktaja pleeha- (spleen due to vitatation of blood)-</b>	Tiredness, vertigo, burning sensation, discoloration, heaviness of body, stupor, and reddening of the abdomen are observed in splenomegaly due to <i>rakta</i> <sup>15</sup>
<b>Pittaja pleeha-(spleen due to vitatation of pitta)</b>	Fever, thirst, burning sensation, stupor, and yellowish discoloration of the body are observed in splenomegaly due to Vitatation of <i>pitta</i> <sup>16</sup>
<b>Kaphaja pleeha-(spleen due to vitatation of kapha</b>	No pain or less pain, larger size, hardon palpation, heaviness, and loss of taste are observed in splenomegaly due to vitiation of <i>Kapha</i> <sup>17</sup>
<b>Vataja pleeha – (spleen due to vitatation of vata)-</b>	Persistent enlargement of the abdomen, continuous flatulence, reversed peristalsis and pain are the features of splenomegaly due to vitiation of <i>vata dosa</i> <sup>18</sup>

**Yakrit Vidradhi-** If *Vidradhi* is In the liver, it produces increased/ difficult respiration and hiccough <sup>19</sup>

**Pleeha Vidradhi** - if *Vidradhi* is In *pleeha*, there is an obstruction to the expiration <sup>20</sup>

**Liver:-**Liver is the most massive of the viscera, occupying a substantial portion of the abdominal cavity. It is essential to life since it carries out a multiplicity of metabolic activities necessary for homeostasis, alimentation, and defense. It is composed largely of epithelial cells (hepatocytes) where most of these biochemical operations occur, bathed by blood derived from the hepatic porta veins and hepatic Arteries, and draining into the inferior vena cava through the hepatic veins. The liver lies in the upper right part of the abdominal cavity, occupying most of the right hypochondrium and epigastrium and extending into the left hypochondrium as far as the left lateral line. The liver is having five surfaces, two-lobe <sup>21</sup>

**Clinical Correlation:-**

- The liver is retained in a normal position by the attachment of the hepatic veins to the IVC. The coronary and triangular ligaments and muscular tone of the anterior abdominal wall contribute to a certain extent.
- The liver may be ruptured by a broken rib or by a stab injury. Due to its vascularity, the liver bleeds profusely.
- Cirrhosis of the liver is the scarring or fibrosis of liver parenchyma due to the toxic effects of ingested substances or drugs. Alcohol is the most common cause of cirrhosis.
- In congestive cardiac failure the pressure in hepatic veins is raised, which leads to venous congestion in the liver and cardiac cirrhosis.
- Hepatic carcinoma is the primary malignancy of liver parenchyma. The secondary malignancy of the liver occurs due to the spread of primary cancer elsewhere ( in the gastrointestinal tract or ovary etc ) via the portal vein. The malignant cells from the breast, lung, or pelvis may also metastasize to the liver <sup>22</sup>
- Liver biopsy – Liver biopsy is a common diagnostic procedure. With the patient holding his or her breath in full expiration – to reduce the size of the costodiaphragmatic recess and the likelihood of damage to the lung – a needle is inserted through the right 8<sup>th</sup> or 9<sup>th</sup> intercostal space in the midaxillary line. The needle passes through the diaphragm into the liver, and a small specimen of liver tissue is removed for microscopic examination <sup>23</sup>

**Spleen:-** The spleen consists of a large encapsulated mass of vascular and lymphoid tissue situated in the upper left posterior region of the abdominal cavity between the fundus of the stomach and the diaphragm. The size & Weight of the spleen varies with the age, of the individual. The spleen has two major functions – removal of particulate material including aging erythrocytes from the circulation and the provision of lymphocytes and antibodies as part of the body’s system of secondary lymphoid tissue

24

### Clinical Correlation:-

- **Splenic hypertrophy-** In individuals suffering a chronic breakdown of erythrocytes, for e.g In malaria and other hemolytic diseases, the splenic tissues may be permanently hypertrophied and the spleen greatly enlarged (splenomegaly).
- **Splenectomy-** Partial splenectomy is followed by rapid regeneration of lost tissue but even total splenectomy has few obvious effects, its function being largely assumed by the liver. However, especially In the early years of life, splenectomy may entail a general reduction in the rapidity of immune responses and consequent increased susceptibility to infection <sup>25</sup>
- **Asplenia** is the absence of a spleen. It is also known as right isomerism, in which bilateral right-sidedness occurs
- **Polysplenia** or left isomerism presents with bilateral left Atria and bilateral left lungs.
- Accessory spleens or splenuculi are formed if individual splenuculi fail to fuse during the development of the spleen. are found in the lienorenal ligament, gastrosplenic ligament, and greater omentum <sup>26</sup>
- **Trauma to the spleen** -Although anatomically the spleen gives the appearance of being well protected, automobile accidents of the crushing or run-over type commonly produce laceration of the spleen. Penetrating wounds of the lower left thorax can also damage the spleen <sup>27</sup>
- **Pleehodara treatment:-**
  - *Suvarn asamaka churanm* <sup>28</sup>
  - Employment of Serpent Venom <sup>29</sup>
  - Cauterisation in splenomegaly <sup>30</sup>

Fire will cast away splenomegaly. Therefore it should be conquered by cauterization, particularly.

The patient should be given oleation and sudation therapies, suitable to the dosa, meals along with yogurt should be consumed and in order to let out blood, the vein in the left arm should be cut in the case of enlargement of stomach caused due to the enlargement of spleen <sup>31</sup>

- *Badarka Patra* use <sup>32</sup>
- The medicated oil prepared by cooking oil with the ash of *kadali,tilanala*, and *ksuraka* consumed daily is capable to cure enlargement of the spleen caused due to *Kapha* and *Vata* <sup>33</sup>

- **Treatment of Yakritroga** – All the therapeutic measures prescribed for splenic enlargement can be used for hepatomegaly or for the disease of the liver. Bloodletting is done from the right upper limb. Burnt ash made of *vidanga*, *pippali*, and *putika* mixed with water and taken in the early hours of the day controls the disease of the spleen and liver. The dose depends upon the individual digestive capacity <sup>34</sup>
- Treatment is similar to spleen inclusive of cutting the vein of the right arm in the case of enlargement of the liver <sup>35</sup>
- **Treatment for both** –
- *Yamanikadi churn.*
- *Vidangadi ksara*
- *Tala Puspa Ksara*
- *Rohitakabhaya kwath*
- *Manadya gudika*
- *Bhallatkadi modaka*
- *Lasunadi kalka*
- *Sarpunkha Kalka*
- *Venesection in plihajakrit roga*
- *Pippalyadi churn*
- *Bhrihat lokanatha rasa* <sup>36</sup>
- **Cadaveric study:-**Liver, the spleen & stomach were Situated in the abdominal cavity close to each other while the lungs & heart were found in the thoracic cavity very close to each other. These all structures contain large amounts of blood. As *vagbhata* has mentioned *Amashaya* (which can be co-related with the Stomach) is a site of *Ranjakpitta* which Plays an important role in the formation of *Rakta* and lies very close to the liver & Spleen in the same cavity. Though stomach can be compared to *Aamashaya* it could not be included as *Raktashaya* anatomically. It lies very close to *Raktashaya*. Liver is termed a site of *Raktashaya* Due to its nature, colour & cadaveric histological appearance. There anatomically, the liver satisfies the criteria for being *Raktashaya*. The spleen is also termed as the site of *Raktashaya* due to its nature colour cadaveric appearance & histological appearance showing white pulp, and red pulp, Production of antibodies supporting tissue are fibro elastic were attributed to constriction & relaxation of blood Vessels. Relations of spleen & stomach were anatomically rising suspicion About their composite role information Of *Rakta*. Liver & Spleen both are termed As *Raktashaya* after the physiological & anatomical comparative study.
- **Conclusion:-**According to various activities the description of *Raktashaya* take into consideration related directly or indirectly to blood, like *phuphus*, *Hridaya*, *Urahsthan*, *Yakrit*, *Pleeha* & *amashaya*. These are the *Raktashaya*. The anatomical & physiological description of the liver & Spleen related to Ayurvedic sharir rachana & sharirkriya Of *Yakrit* & *pleeha* with respect to its Development structure & functions. A complete review of the above Ayurvedic study & the cadaveric study Shows evidence of *yakrit* & *pleeha* to be the seat of *Rakta* i.e. *Raktashaya* when Compared with modern anatomy. The causative factor of *Rakta* & their symptoms of *Raktadhatu*, and *Raktavahasortas dushti* signifies the degeneration of *Yakrit* & *pleeha* i.e. liver respectively. In this article, I conclude *Raktashya*, liver, and spleen their anatomical position, disease & treatment of liver & spleen.

• **Reference:-**

- 1- Prof. K. R SRIKANTHA MURTHY, Sushruta Samhita of Sushruta Sharir 5/5, Reprint Ed.Varansi ;  
Chaukhambha Orientalia , Page 79
- 2- Prof. K. R SRIKANTHA MURTHY, Sushruta Samhita of Sushruta Sutra 21/16, Reprint Ed.Varansi ;  
Chaukhambha Orientalia , Page 157
- 3- Easy Ayurveda.com
- 4- Santosh Kumar Thakur, Sumit Natthani, Mita kotecha Ancient notion on Yakrit vikara (Liver disorder in  
ayurveda ) Global Journal for Research ANalysis Volume -9, Issue -10 October 2020
- 5- Charaka Samhita English Translation of Text with Ayurvedadipika Commentary of Chakrapanidatta -  
Purvardha Part-1 Viman 5/8 page-708, Reprint Edition 2020 Chaukhambha Vishavabharti
- 6- Prof. K. R SRIKANTHA MURTHY, Sushruta Samhita of Sushruta Sharir 9/12, Reprint Ed.Varansi ;  
Chaukhambha Orientalia , Page 149
- 7- Prof. K. R SRIKANTHA MURTHY, Sushruta Samhita of Sushruta Sharir 5/37, Reprint Ed.Varansi ;  
Chaukhambha Orientalia , Page 97
- 8- Prof. K. R SRIKANTHA MURTHY, Sushruta Samhita of Sushruta Sharir 7/6, Reprint Ed.Varansi ;  
Chaukhambha Orientalia , Page 123
- 9- Acharya Harita Harita Samhita (Sanskrit text with English Commentary) by Prof.(Dr) Gyanendra Pandey  
Volume 2 Chaukhambha Sanskrit Series office Varanasi First edition 2014,3/26
- 10- ANCIENT NOTION ON YAKRIT VIKARA (LIVER DISORDERS IN AYURVEDA), Santosh Kumar  
Thakur, Sumit Natthani, Mita Kotecha EGLOBAL JOURNAL FOR RESEARCH ANALYSIS: Volume-  
9 | Issue-10 | October-2020
- 11- Charaka Samhita English Translation of Text with Ayurvedadipika Commentary of Chakrapanidatta  
Uttarardha Part -2 Chikitsa 13/35-36, page 392, Reprint Edition 2021 Chaukhambha Vishavabharti
- 12- Charaka Samhita English Translation of Text with Ayurvedadipika Commentary of Chakrapanidatta  
Uttarardha Part -1 Chikitsa 13/37, page 392, Reprint Edition 2021 Chaukhambha Vishavabharti
- 13- Charaka Samhita English Translation of Text with Ayurvedadipika Commentary of Chakrapanidatta  
Uttarardha Part -1 Chikitsa 13/38, page 392, Reprint Edition 2021 Chaukhambha Vishavabharti
- 14- Charaka Samhita English Translation of Text with Ayurvedadipika Commentary of Chakrapanidatta -  
Purvardha Part-1 Sutra 18/28 page-289, Reprint Edition 2020 Chaukhambha Vishavabharti
- 15- Bhavaprakasa of Bhavamisra (original text along with commentary and translation) Madhyama and  
Uttarakhand-vol.2, Chaukhambha Orientalia Reprint Edition 2017 Page 385
- 16- Bhavaprakasa of Bhavamisra (original text along with commentary and translation) Madhyama and  
Uttarakhand-vol.2, Chaukhambha Orientalia Reprint Edition 2017 Page 385

- 17- Bhavaprakasa of Bhavamisra (original text along with commentary and translation) Madhyama and Uttarakhand-vol.2, Chaukhambha Orientalia Reprint Edition 2017 Page 386
- 18- Bhavaprakasa of Bhavamisra (original text along with commentary and translation) Madhyama and Uttarakhand-vol.2, Chaukhambha Orientalia Reprint Edition 2017 Page 387
- 19- Madhava Nidanam ( Roga Viniscaya) of Madhavakara (A treatise on Ayurveda) by Prof.K.R Shrikantha Murthy Chaukhambha Orientalia Varanasi Reprint Edition,2018i Page 124
- 20- Madhava Nidanam ( Roga Viniscaya) of Madhavakara (A treatise on Ayurveda) by Prof.K.R Shrikantha Murthy Chaukhambha Orientalia Varanasi Reprint Edition 2018,Page 124
- 21- Gray's Anatomy International Student Edition, The anatomical basis of Medicine and Surgery, Thirty-Eighth Edition Chairmen of the editorial board The late Peter L.Williams .page 1795
- 22- Clinical Anatomy (A Problem-Solving Approach) Third Edition 2016 Volume 2 Neeta V Kulkarni Jaypee Brother's Medical Publishers (P) Ltd Section 6 page 552
- 23- Gray's Anatomy International Student Edition, The anatomical basis of Medicine and Surgery, Thirty-Eighth Edition Chairmen of the editorial board The late Peter L.Williams .page 1808
- 24- Gray's Anatomy International Student Edition, The anatomical basis of Medicine and Surgery, Thirty-Eighth Edition Chairmen of the editorial board The late Peter L.Williams .page 1437
- 25- Gray's Anatomy International Student Edition, The anatomical basis of Medicine and Surgery, Thirty-Eighth Edition Chairmen of the editorial board The late Peter L.Williams .page 1442
- 26- Clinical Anatomy (A Problem-Solving Approach) Third Edition 2016 Volume 2 Neeta V Kulkarni Jaypee Brother's Medical Publishers (P) Ltd Section 6 page 559
- 27- Clinical Anatomy By Regions Ninth Edition 2012,2008,2004 Lippincott Williams & Wilkins, a Wolters Kluwer buisness,Richard S.Snell , M.R.C.S.,L.R.C.P.,M.B.,B.S.,M.D.,pH.D.
- 28- Bhela -Samhita Text with English Translation by Dr.K.H.Krishnamurthy Editor Prof Priya Vrat Sharma Chaukhambha Vishavabharti Reprint Edition 2021,13/27-32. Page 378
- 29- Bhela -Samhita Text with English Translation by Dr.K.H.Krishnamurthy Editor Prof Priya Vrat Sharma Chaukhambha Vishavabharti Reprint Edition 2021,13/33-36. Page 379
- 30- Bhela -Samhita Text with English Translation by Dr.K.H.Krishnamurthy Editor Prof Priya Vrat Sharma Chaukhambha Vishavabharti Reprint Edition 2021,13/45. Page 381
- 31- Astanga Hridya of Vagbhata Vol 2 Translated and Edited by: Kajiv Lochan Chaukhambha Publications New Delhi Reprint Edition 2018, Chikitsa 15/85 Page 396
- 32- Astanga Hridya of Vagbhata Vol 2 Translated and Edited by: Kajiv Lochan Chaukhambha Publications New Delhi Reprint Edition 2018, Chikitsa 15/90 Page 397
- 33- Astanga Hridya of Vagbhata Vol 2 Translated and Edited by: Kajiv Lochan Chaukhambha Publications New Delhi Reprint Edition 2018, Chikitsa 15/95 Page 398
- 34- Bhavaprakasa of Bhavamisra (original text along with commentary and translation) Madhyama and Uttarakhand-vol.2, Chaukhambha Orientalia Reprint Edition 2017 Page 387
- 35- Astanga Hridya of Vagbhata Vol 2 Translated and Edited by: Kajiv Lochan Chaukhambha Publications New Delhi Reprint Edition 2018,Chikitsa 15/98 Page 399
- 36- Cakradatta ( Chikitsa Sangraha ) of Chakrapanidatta Sanskrit text with English Translation by Dr g.prabhakara Rao Chaukhambha Orientalia first Edition 2014 chap.38, page 376-382