



Indian Journal of Agriculture and Allied Sciences

A Refereed Research Journal

ISSN 2395-1109

e-ISSN 2455-9709

Volume: 3, No.: 3, Year: 2017

www.mrfsw.org

Received: 10.09.2017, Accepted: 20.09.2017

Publication Date: 30th September 2017

CRITICAL EVALUATION OF MUTR ASHMARI IN AYURVEDA

Sharma Dheeraj¹ and Kumar Jitendra²

¹Associate Professor, Department of Shalya tantra, Gangasheela Ayurvedic Medical College & Hospital Bareilly, E-mail: dheeraj.sharma326@gmail.com and ²Assistant Professor, Department of Vikriti Vigyan, Gangasheela Ayurvedic Medical College & Hospital Bareilly, E-mail: drjitendrakumarverma@gmail.com, Corresponding author: Jitendra Kumar

Abstract: Urolithiasis (Mutr Ashmari) is one of the commonest disease which has been in existence since time immemorial but unfortunately even today no effective treatment, other than surgical manipulation to remove the stone. The surgical procedure to remove the stone termed as 'Lithotomy', is also not considered to be a radical treatment for urolithiasis, because recurrence of urolithiasis is often found once, twice or even several times after the removal of stone. This is the problem with the clinicians and efforts are being made constantly by the clinicians and other medical scientists to find out some effective measures to cure this disease. One of the basic reasons for not finding out a radical cure is that the etiopathogenesis of urolithiasis has not been yet clear inspite of tremendous work in this field.

Ayurvedic literatures describe in detail the etiopathological factors of urolithiasis (Ashmari) and it is pertinent to note that Sushruta, the father of surgery made a critical evaluation of all the conditions, which might cause urolithiasis (Ashmari).

Acharya Sushruta has given great importance to the age factors, dietary habits- (Pathy-Apathya), and living conditions including influence of sleep at day time (Diva-Swapna) for the occurrence of Ashmari (Urolithiasis).

In Ayurveda, Ashmari can be correlated to urolithiasis and Acharya Sushruta, had elaborately described aetiopathogenesis, symptomatology and management of Ashmari by drugs and surgery. A number of medicinal plants have been claimed to have litholytic and lithopreventive properties.

Keywords: Mutra Ashmari, Mutra Roga, Urolithiasis.

Introduction: Disease of the urinary tract have been recognized and given important place in the Ayurvedic system of medicine by all the ancient medical authorities. The history of medicine indicates that the ancient Hindu medicine practiced in India in the earliest time was a equally developed scientific discipline as any other contemporary systems of medicine in world. The oldest repositories of human knowledge are Vedas, described the anatomical, physiological and pathological aspects of urinary disorders.

In Ayurvedic texts one of the commonest pathological conditions of the urinary system is reported as *Ashmari*. The word *Ashmari* is literally derived from two words, *Ashm* and *Ari*, means there is a stone behaving like enemy. Acharya Sushruta, calls it a formidable disease- *Darun Vyadhi* ^[1], resembling 'Yam' the 'God of death'. Vagabhatta considered it as a *Maharoga*,

because of the difficulty in eradicating the disease completely.

From this discussion it can be inferred that they had deligated a prominent place for the disease *Ashmari*. *Vasti* (Urinary bladder) has been considered as the seat of all urinary diseases ^[2] including *Ashmari Roga*.

Anatomical Consideration of Urinary Tract in Ayurveda: Anatomical descriptions of urinary system are rather scattered and sometimes confusing in Ayurvedic literature. If all the related descriptions are collected and arranged at one place it will not be very difficult to allay the doubts about the ancient literatures. On the other hand one will appreciate the scientific truth lying in the ancient texts. An attempt in this direction is made here in.

In Ayurvedic text the anatomy of the urinary system included mainly- *Mutra vaha Dhamani-Dvya* (Renal Arteries), *Vrikka Dvya*

(Kidneys), *Gavini Dvya* (Ureters), *Mutrasaya* (Urinary bladder) and *Mutra Prasheka* (Urethra).

Apart from the above, many structures which lie in relation to urinary bladder are also available in the literatures like vas, seminal vesicles, ejaculatory ducts, prostate, rectum and in women ovaries, oviduct, uterus and vagina also.

1. Mutravaha Dhamani Dvya (Renal Arteries): In the chapter of Sushruta Sharir ninth, there are descriptions of *Adhogama Dhamanies*, where *Mutravaha Dhamani Dvya* are described in relation with *Udarya Mahadhamani* (Abdominal aorta) in nine branches and one *Sira* (Portal vein). It is originated from *Pittashaya area* (Duodenal area) and *Adhonabhi-Pradesh* (Hypogastric region) and distributed between these areas. In relation to modern view one can find that these ten arteries are included-One celiac artery, one superior mesenteric artery, two renal arteries, one inferior mesenteric artery, two testicular or ovarian arteries and one portal vein. Apart from that they also described various arteries which supply the other pelvic organs^[3]. So one can say the *Mutravaha Dhamani Dvya* (Renal arteries) is a part of *Adhogama Dhamanies*.

Acharya Dalhana considered the *Mutravaha Dhamani Dvya* a further division as *Dashadha*, *Shatadha* and *Sahashtadha*. *Acharya Sushruta* has described that *Mutravaha Dhamani Dvya* divided in thousand and thousands of minute branches as *Sahashtadha* which can not be visible by naked eye due to their minuteness^[4]. *Acharya Vagabhatta* clearly said that these *sahashtadha* division of *Mutravaha Dhamani Dvya* are responsible directly for the filtration of *Mutra* (urine). Although no clear descriptions were found about the seat of that division in *Samhitas* yet it is clear in the description of the *Vrikka Dvya*.

2. Vrikka Dvya or Vankshana Yugal (Kidneys) : It is enumerated as one of the *Kosthanga* out of fifteen *Kosthangas*, as *Virkka Dvya* and situated one in the left and one in the right side as fleshy rounded mass. According to Ayurvedic embryology the *Vrikkas* (Kidneys) are composed of the essence of blood (*Rakta*) and fat (*Meda*)^[5]. Mainly from maternal contribution (*Matrijabhava*)^[6]. Some scholar has described the actual meaning of word *Vrikka*: is selective filtration and re-absorption and word *Vankshana* as composite organ of *Sira*, *Dhamani* and *Srotasa*. Apart from that *Vagabhatta* has mentioned the word 'Vrikka' under the

description of *Kosthanga*. The above descriptions clearly indicate that the organ *Vrikka* referred to the *Kidneys*.

3. Mutravaha Srotayugal or Gavinies (Ureters): In Atharva Veda *Gavinies* (ureters) have been described to be two in number connected with urinary bladder, carrying urine to the bladder^[7,8]. Though no detail descriptions of *Gavinies* have been found in Ayurvedic literatures but for *Vastikarma*, the Ayurvedic physician used to make *vasti* (receptacle to contain the medicinal fluid) of urinary bladder of goats, sheeps or buffalows and they advised to close all of the openings except one urethral opening^[9]. Therefore, they know about the *Gavini* (ureters) because they must be used to close the openings of ureters (*Gavinies*).

4. Vasti or Mutrashaya (Urinary Bladder): Description of urinary bladder (*Vasti*) is comparatively precise and clear in Ayurveda. Much emphasis has been given on *Vasti* by all the authorities of Ayurvedic classics. Urinary bladder (*Vasti*) has been said to be one of the vital organs (*Marma*) of the body^[10]. *Vasti* has been described as the seat of all the urinary disorders^[11]. The synonyms of *Vasti* are *Mutrashaya*, *Vasti Putaka*, *Mutra Putaka*, and *Mutradhara*.

From embryological point of view the *Vasti* is made up by the essence of blood (*Asrija* and *sleshma*) with help of *Pitta* & *Vayu*. Furthermore, *Vasti* is described as an organ derived from softer maternal contribution (*Matrija Avayava*).

In Atharva Veda, *Vasti* is described as the seat of urinary disorders. Charaka has described *Vasti*. While describing the three vital organs (*Murma*), he has said that *Vasti* is situated in between the rectum (*Sthula Guda*), testis (*Muska*), perineal raphe (*Sivani*), *Shukravaha* & *Mutravaha Srotasas* and is carrying the aqueous elements^[12]. While counting eight *Ashayas* in the body, *Sushruta* has mentioned that *Vasti* is one of the *Ashayas* containing *Mutra* i.e. "*Mutrashaya*."^[13]

Further in "Nidanasthana" Adhyaya-3, *Sushruta* has described urinary bladder (*Vasti*) in a beautiful way that the *Vasti* is situated in the pelvic cavity surrounded by *Naval* or *Nabhi*, rectum or *Guda*, groin or *Vankshana* and penis or *Shepha*. The *Vasti* has thin wall with a single aperture or opening and lies with its mouth downwards and is covered with veins (*Siras*), ligaments (*Snayu*) and has a shape like the guard-*Alabhu*. The other structures having interrelation

in the pelvic cavity are fundus of the bladder (*Vasti Shira*), prostate (*Paurusam*), testis (*Vrisana*) rectum, *Maladhara* (The receptacle of impure matter), and the seat of life (Pranayatana) [14].

Thus the classical description of *Vasti* in Ayurveda suggests that *Vasti* is nothing but the urinary bladder, as known today in modern medical sciences.

5. Medhra or Mehana (Penis): The word *Medhra* was meant to signify the Penis or Penile urethra (*Acharya Dalhna-Mutra Prasheka*). This is connected or originated from the lower end of bladder (*Vasti*) and release the flow of urine whenever it is required. *Acharya Sushruta* cautions about the inquiry of *Mutra Prasheka* and *Mutravaha Srotasa* at the time of operation of *Ashmari* [15]. Thus by the above descriptions it is clear that *Medhra* or *Mehana* is urethra or Penile Urethra.

Physiological Aspect of Urinary System in Ayurveda: While dealing with the physiology of the urinary system in Ayurveda, one has to aware of certain important descriptions given in the context of both, the digestion of Ahara Dravyas (foods) and urinary disorders especially in formation of urinary stone (*Ashmari*) and *Prameha*. An attempt is made to bring together the various scattered ideas about the functional aspects of urinary system, so that the kriya-sharira (Physiology) of urine formation becomes clear.

What so ever foods and drinks that an individual takes its essence is absorbed into the system after proper digestion. The absorbed material metabolised and unuseful substances are excreted out of the system as solid and liquid in the form of faeces and urine through anal canal (*Guda*) and urinary tract respectively.

The *Unduka* (Caecum) is a junction where small intestine and the large intestine of the gastrointestinal tract (*Mahasrotas*) meet. Here the separation of *Maladrava* (liquid stool) and *Sara* (Rasa) takes place. The essence is absorbed into the system and the residue is poured into the large intestine (Pakwashaya) [16] here the absorption of water again takes place from liquid under the influence of *Samana Vayu* and the solid residue (stool) thrown down in the rectum to be excreted out through anal canal.

The absorbed water through the large intestine is known in the Ayurveda as on of the *Upadan Dhatus* or precursor of urine which is needed to the system for washing off the effect materials (*Kleda*) of the body. The absorbed

liquids from the small intestine in the form of *Rasa* and from large intestine in the form of *Maladrava*. The fluid material absorbed from the large gut acts as precursor of urine for washing off effect substances of body which occurs due to wear and tear of tissues in a living organism. If this precursor of urine absorption is get disturbed as it happens in case of diarrhoea, the suppression of urine occurs. While describing the whole course of urine, the Atharva Veda remarks that the formation of urine starts from the large intestine and ends at the ureters (*Gavini*). The concept of intermediary link of the urinary system becomes more clear when the description of *Sharangadhar* is considered.

The essence of the food (*Ahar*) absorbed from small intestine, mixed with the water absorbed from the *Mala drava* in large intestine, travels through out the body as *Rasa*, reaches to the *Vasti* where it is converted in urine (*Mutra*).

Vasti, the urinary tract consists of two meanings. The term "*Vasti*" is used in Ayurveda in different meaning at different context. At places *Vasti* refers merely as a organ (*Ashaya*) where the urine gets stored. But in some places the term '*Vasti*' indicates the site where the formation of urine takes place. The above statement is also supported from the descriptions of various urinary disorders where "*Vrikka*" is not mentioned in relation to urinary disorders like *Mutraghata*, *Mutrakicchra*, *Ashmari*, *Prameha* etc. Rather the term *Vasti* has been used in all such places.

The role of *Vrikka* (kidneys) in the formation of urine in Ayurveda, is controversial. So far no definite statements is available about the role of *Vrikka* in the formation of urine rather they are linked with the "*Meda Dhatu*" and *Meda Vaha Srotasa* [17].

Some authors described from the etiological aspect given by "*Panini*", the term "*Vrikka*" denotes-"to accept" and "to ease." This probably refers to filtration and selective absorption of substances (*Rasa*) for formation of urine. According to descriptions available in the Ayurvedic literatures, *Vasti* plays important role in the formation and storage of urine. *Vasti* is described as a fleshy, hollow organ, lies in the pelvic cavity with it's mouth downwards [18]. It links with thousand and thousands fine channels from *Pakwashaya* (large intestine) and through these fine channels fluid poured in the bladder continuously resulting into the formation of urine, as is when a hollow earthen pitcher dipped in water up to it's neck, in due course of time the

water enter inside the pitcher through its minute pores^[19].

Sushruta has been further described that as rivers with their tributaries fill the ocean by water, in the same fashion the Vasti is filled by channels continuously. The act of filling is a continuous process irrespective of the various states of life like awakefulness and sleeping etc^[19].

If the above statement is considered, no direct anatomical link could be seen from Pakwashaya to Vasti through which fluid travels and poured inside the vasti to form urine. Such links between these two organs were probably made, based on certain clinical observations like during dehydration, resulted from Atisar (diarrhoea), thrust etc, there is suppression of urine. Based on such observations they have probably made such links between these organs.

Formation of urine could also be seen from other angle also, where the ocean could be compared with vasti, river with *Gavini* (ureter), and thousand and thousands invisible minute channels through which fluid enters in vasti with *Vrikkas*.

Etiopathogenesis and Classification of Ashmari Roga:

Acharya *Sushruta* being a surgeon himself has described in details its etiopathogenesis, symptomatology, prognosis, medical and surgical managements separately. He was the first surgeon to advice surgical removal of stone. Apart from *Sushruta Samhita*, other Ayurvedic texts of that time also have described *Ashmari* as one of the varieties of dysuria (*Mutrakriccha*) and discussed its etiology along with other conditions of dysuria. In Ayurvedic system of medicine urinary diseases are divided into two main groups: (a) *Atipravrittaja* (b) *Apravrittaja*.

a. Atipravrittaja: This group includes diseases of urinary system in which polyuria is the main complaints. *Prameha* and its twenty varieties come under this group.

b. Apravrittaja: In this group of urinary diseases are those in which the main symptom is dysuria (*Mutrakricchra*) or retention of urine (*Mutraghata*). This group is further divided in to two groups. (i) *Mutrakricchra*, (ii) *Mutraghata*.

i. Mutrakricchra (Dysuria): *Mutrakricchra* and its eight varieties-According to the Ayurvedic samhitakar, *Ashmari Roga* is considered as one of its varieties because dysuria is the chief complaint in case of *Ashmari Roga*.

ii. Mutraghat: (Retention of Urine): Thirteen varieties are considered under this heading. The

main difference between *Mutrakricchra* and *Mutraghata* is that while in the former there is much pain during micturition and less retention, Obstruction in the flow of urine is the chief complaint in the latter with less pain during micturition^[20].

Acharya Sushruta has laid much stress on *Sleshma* in the etiology of *Ashmari*. He has said that the base or the nucleus (*Adhithana*) of stones (*Ashmari*) is *sleshma*^[21]. *Acharya Vagahatta* supports this theory also^[22]. Further, *Sushruta* was the first Samhitakara who described the four varieties of *Ashmari*^[23]. *Acharya Sushruta* also described the urolith (*Ashmari*) as a separate disease inspite of a condition of *Mutrakricchra*, mentioned its etiopathological factors as follows: People who do not take proper cleaning procedure (*Asanshodhana*) and are indiscrete regarding their dietary habits (*Apathya karinah*) get their *Sleshma Dosa* aggravated and this on being mixed with urine (*Mutra Samprakto*) enters the urinary bladder to produce calculi (*Ashmari*)^[24].

Infants are more susceptible to an attack of any of the three (*Sleshmaj*, *Pittaj* and *Vataj*) types of *Ashmari*. They are in the habit of sleeping in day time (*Diva-Swapna*) or of taking food composed of both wholesome and unwholesome ingredients (*Samasana*)^[25] and are indiscrete in their food habits i.e. indulge in eating before the digestion of a previous meal (*Adhyashana*)^[26], eating cold (*Sheeta*), fatty (*Snigdha*), heavy (*Guru*). Plus sweet (*Madhura*) food in excess. In children both the body and bladder are small in size so stones (*Ashmari*) in those children can be extracted rather easily^[27]. *Acharya Charaka* has been described also the *Asmari* in the chapter of *Mutrakricchra* as one of the kind of *Mutrakricchra*. But unlike *Sushruta*, he has not described *Ashmari* as a separate entity. The etiology of *Ashmari*, according to *Charaka*, is the same as the general etiology of *Mutrakricchra*, Hence etiology of *Ashmari*, according to *Charaka*, are as follows: Excessive physical exercise, Strong and irritant medications, (*Tikshna-Ausadhi*), continuous indulgence in dry wine, riding on fast racing horses or excessive riding on fast moving vehicles, ingestion of the flesh of wet-land creatures and fishes, eating before the digestion of a previous meal (*Adhyashana*) are said to be the cause of eight varieties of *Mutrakricchra* and thereby causing *Ashmari* too^[28].

Further *Acharya Charaka* cautions the patients of *Ashmari* to avoid the following acts

during the management of *Ashmari*: Exercises, Suppression of natural urges, ingestion of dried and un-unctuous articles, baked food, excess to wind and sun, eating of food substances which may aggravate Vata Dosa, i.e. lotus-rhizomes, wood apple, Jambul, lotus-stalk and articles of astringent taste are to be avoided by the patients of *Ashmari* ^[29].

It is said that *Charaka* has not emphasised, *Sleshma-Dosa* as a causative factor for *Ashmari* as was done by *Sushruta*. *Charaka* emphasises Vayu Dosa as a contributory factor, which will be clear from his description of the pathogenesis of *Ashmari*. During prescribing the treatment of *Ashmari* in the same chapter of *Mutrakricchra*, *Charaka* emphasises on *Kapha* and *Vata Dosas* and gravel (*Shankara*) in the urinary tract, the treatment indicated in case of dysuria (*Mutrakricchra*) due to *Kapha* & *Vata*, is beneficial ^[30].

Maharsi Kashyapa has given the etiology of *Mutrakricchra* which includes etiology of *Ashmari* also. The etiological factors of *Mutrakricchra* as described by *Kashyapa* are: Carrying heavy loads on the loins (*Kati*) and shoulders (*Skandha*) by which *Pitta* is vitiated and in combination with *Kapha* and *Vayu* enters the *Vasti* affects the urinary bladder (*Vasti*) and thus causes *Mutrakricchra* ^[31].

The above description by *Kashyapa* indicate that he laid more emphasis on *Pitta Dosa* than *Kapha* and *Vata Dosas*. It is pertinent to mention however that the available literatures on *Kashyapa-Samhita* are at many places found incomplete as the texts cited by the commentator are often reproduced with gaps at several places. The chapter on *Mutrakricchra Chikitsa* also states with a stanza, in which a few of the opening lines are not reproduced, So, it is therefore, difficult to conclude that *Kashyapa* emphasised the importance of *Pitta Dosa* alone. It will be more evident from the following- During the description of differentiation between *Prameha* and *Mutrakricchra*, *Kashyapa* has said that deranged *Pitta* is main cause of *Kricchra* and places of the *Vayu* are the seat of *Mutrakricchra*. But during the description of management of *Mutrakricchra*, *Kashyapa* prescribed the *Pitta shamaka*, ingredients, for example-Sweet (*Madhura*), Sugar- cane products (*Icchu*), Ghee etc and said that Astringent (*Sangrahi*) and *Vidahi* i.e. *Pitta* vitiating materials should not be taken. This description itself shows that *Kashyapa* has laid great

emphasis on *Pitta Dosa* in relation to *Mutrakricchra* thereby to *Ashmari* also.

However again during the description of the pathogenesis of *Ashmari*, *Kashyapa* emphasises the role of *Vata Dosa*. So it is very difficult to conclude any thing. To sum up the above descriptions of different texts, the following points regarding the etiology of *Asmari* can be drawn up.

1. Sleshma Dosa is essential as it is the seat, nidus or nucleus (*Adhithana*) for *Ashmari*→ (*Sushruta*).
2. Childrens are more prone to get *Ashmari*→ (*Sushruta*).
3. Avoidence of cleansing procedures (*Asanshodhana*) → (*Sushruta*).
4. Indiscrimination of dietary habits (*Apathyakarina*) → (*Sushruta*)
5. *Vata Dosa* is important as it dries the other *Dosas*- (*Charaka*) as well as *Vata Dosa* Churns (*Mathita*) the urine-(*Kashyapa*).

Sleshma: *Sleshma*, consist of *Jala* and *Prithavi Mahabhutas*. *Ashmari* is composed of *Prithavi Mahabuta* augmented by *Jala*. Here *Kapha* (*Sleshma*) forms the cementing substance.

Madhura Rasa: Because like causes produce like effects ^[32]. So following elements help in *Ashmari* formation, *Madhur Rasa* has predominantly in *Prithavi* and *Jala Mahabhutas* with the qualities of *sneha*, *Gaurava*, *Sheeta*, *Picchila* etc ^[33]. Hence it aggravates *kapha* thereby initiates formation of *Ashmari*.

Diva-Svapna: Day sleep or excess sleep aggravates *sleshma* ^[34]. *Tamoguna* is predominantly associated with *Prithavi Mahabhuta*. *Tamo guna* is aggravated by excessive sleep and thus the excessive sleep is calculogenic. In the *Sutrasthana*, *Adhyaya* 21, *Sushruta* has enumerated the causes of aggravation of *sleshma* as follows-

1. Day sleep (*Diva Svapna*)
2. Lack of exercise and Physical activities (*Avyayama*).
3. Taking of-(a) Sweet (*Madhura*), (b) Sour (*Amla*) (c) Salty (*Lavana*), (d) Cold (*Sheeta*), (e) Fatty (*Snigdha*), (f) Heavy (*Guru*), (g) Slimmy (*Picchila*), (h) Abhishyandi in nature e.g. *Dhanyaka*, *Yava*, *Mahamasa*. *Tila-Pista* and its products etc.
4. Taking food composed of both wholesome and unwholesome ingredients (*Samshana*) and are in the habit of eating before the digestion of a previous meal (*Adhyashana*),

etc. are said to cause aggravation of Shleshma.

Embryologically *Vasti* is formed from the essence of *shleshma* therefore *Ashmari* is formed mostly in *Vasti*.

Childrens are Sufferers of Ashmari Roga:

Though adults also suffer from *Ashmari* yet childrens are more prone to suffer from *Ashmari*. The causes are as follows:

1. Child age, is the age when *Shleshma* predominates and thereby favours the formation of *Ashmari*.
2. Children generally like sweets, cold, heavy and fatty food which increase *Shleshma* and thereby chances of *Ashmari* formation increases.
3. Childrens are in the habit of sleeping in day time which increases *Shleshma* [35] and thereby make the children prone to *Ashmari* formation.

Asamshodhana (Non-observance of Cleansing Procedure): Seasonal and other natural variations may produce diseases by vitiating and accumulating the *Dosas* [36], and thus the *Dosic equilibrium* which is the basis of good health is disturbed. For maintaining the *Dosic equilibrium* cleansing procedure like purgation, vomiting etc, are considered necessary in Ayurvedic texts. If these cleansing procedures are not done, the *Dosic equilibrium* will be disturbed which in its turn will result in diseases and particularly will cause *Ashmari* [37].

Unwhole Some Diet and Habits (Apathya): Any food or habit which is wholesome and beneficial to health is *Pathya*. Food which while passing through the bodily channels do not impair the body system and habits, which are pleasing to the mind are wholesome (*Pathya*). Those habits, which are not pleasing and those foods which may adversely affect the body system, are unwholesome (*Apathya*) [38].

This however should not be regarded as an invariable rule. These factors, by reason of variation in effect due to measure, time, mode of action, habitat of drugs, bodily constitution and *Dosas*, shows itself either as wholesome (*Pathya*) or unwholesome (*Apathya*) conditions [39].

Ashmari is formed in the urinary tract (*Mutravaha Srotasa*) and following causes can vitiate this *Srotasa* and thereby can cause uroliths as described by *Charaka*. One who ignores the call of nature for micturition and at the same time takes water or food or indulges in sexual intercourse or resists the urge for micturition gets

his *MutraVaha* srotasa vitiated and thus a person suffering or an injured person also is likely to get his *Mutra Vaha Srotasa* vitiated [40]. Physical exercise is good for health and lack of it will be *Apathya* [41]. The healthful living is also determined by eight aspects of diet. “*Asta Aharavidhi Vishesa Ayatana*”, the eight factors which determine the utility or otherwise of various types of food are (1) Nature of food article (*Prakrti*) (2) Method of their processing (*Karana*) (3) combination (*Samyoga*). (4) Quantity (*Rashi*) (5) Habitat (*Desha*) (6) Time or stage of the individual food material (*Kala*) (7) Rules governing the intake of food (*Upayoga Samstha*) (8) and wholesome to the individual who take it (*Upayokta*) [42].

These eight criteria help us to know as to which food, how much food, what quality of food are to be taken, when to be taken, what should be the mental condition and what should be the discipline of the body, mind and speech.

Thus it has been said that while taking food one should neither speak, nor talk and should have a cheerful mind and should be attentive about eating the meal.

Acharya Sushruta also indicates that by taking substances which are incompatible to one another as regards their tastes, potencies and digestive transformations, a greedy and intemperate person becomes afflicted with disease and weakness of the sense-organs, and ultimately meets with his doom [43].

Thus it is evident that dietary habit (*Pathya-Apathya*) plays an important role in the causation or prevention of all diseases. But it is of special importance in the pathogenesis of *Ashmari* mentioned by *Sushruta* and others. It may be pointed out here that modern views also lay great emphasis on the role of diet.

Pathogenesis: The urinary bladder (*Vasti*) has been described as the seat of urinary stone (*Ashmari*) by the different authors [44]. They also preferred different similies to elucidate the pathogenesis of *Ashmari* by involvement of *Dosas* and their specific roles in formation of *Ashmari*, according to *Sushruta Samhita*, is as follows: When urine enters the urinary bladder (*Vasti*) it carries along with *Vata*, *Pitta* and *Sleshma*, which are not discernible easily. These *Dosas* get mixed up with the residual urine, retained in the urinary bladder (*Vasti*) and the products which has adhesive and slimy (*Upsnehata*) character, agglomerate to give rise to the deposition of stone (*Ashmari*) [45]. The process of formation of *Ashmari* in due course of

time like that as the gradual deposition of precipitates in a new and clean earthen pitcher takes place, even when absolute clean water is filled in to this ^[46].

Sushruta has given another beautiful simile to illustrate the formation of uroliths (*Ashmari*) that as the wind and fire (*heat energy*) of lightning jointly condense the rain water to form hail-stones, in the same way *Vayu* and *Pitta* (heat energy of body) jointly contribute to the condensation of *shlesma* in the bladder (*Vasti*) and transforms it into stones (*Ashmari*). As already mentioned during the description of *Ashmari* at the beginning of the chapter "*Ashmari Nidana*". *Sushruta* has emphasised the role of *Shlesma Dosa* in urolithiasis (*Ashmari*) and said that *Shlesma* is the seat, nucleus or nidus (*Ashisthana*) of all four varieties of *Ashmari* ^[47].

The *Vata* (*Maruta*) in the bladder (*Vasti*) coursing in its natural downwards direction helps in the full and complete drainage of urine, while coursing in opposite or in reverse direction, it gives rise to various forms of disorders like *Strangury*, *Parmeha* as well as *Shukra dosa* (seminal disorders). In short, it may produce any of the urinary troubles to which the bladder may be subjected too. ^[48]

It shows that in "*Ashmari Nidana*", *Sushruta* has given second importance to *Vata Dosa* impairment of which may lead to various urinary disorders.

Acharya Charaka has described the common or general etiological factors of *Mutrakricchra*, *Ashmari*, separately. While describing the pathogenesis of *Mutra Kricchra*, he writes- "The humors (*Dosas*) being provoked by their respective etiological factors individually or collectively and reaching the urinary passage, begins to compress them on all sides. When this occurs in the patients, they urinate with pain, that is, there results dysuria (*Mutrakricchra*). ^[49]

But where describing the pathogenesis of *Ashmari* *Acharya Charaka* has said that-*Vata* (*Pavana*) as the prime mover, dries up the urine in the bladder along with the Semen (*Shukra*), *Pitta* and *Kapha* then gradually a stone is formed, just as a gall-stone is formed from the bile of the cow ^[50].

Thus we find that the idea of the accumulation of precipitate, leading to the formation of *Ashmari*, is accepted both by *Charaka* and *Sushruta*. During the process of *Ashmari* formation *Charaka* gives the main importance to *Vata Dosa* as the initiator of the

process. But *Sushruta* lays emphasis on *Shlesma Dosa* as the first offender.

Acharya Kashyapa said that urinary stone (*Ashmari*) begins to accumulate from urine just like gall stones (*Gorochana*) arises from the bile of the cow. In describing the formation of *Ashmari* in *Mutrakricchra Chikitsa Adhyaya*, he has said-

Just as gall stones is formed from the bile in cows, in the same way gravel (*Sharakara*) like bodies are formed from the urine in the patients of *Mutra kricchra* whether afflicted with one *Dosa* or with *Tridosas*. The unethical conduct of life or unhygienic conditions of these patients aggravate the *Vata*, which in its turn, churns the urine to cause precipitation of these *Sharakaras*, which resemble as particles of gold or mustered seeds and agglomeration of these particles result in the formation of *Ashmari* ^[51].

Further *kashyapa* says that *Ashmari* begins to grow in size in the bladder as a foreign body and as the patient gets emaciated, *Ashmari* too becomes smaller; where as when the patient becomes fatty (healty) *Ashmari* also increases in size .

Pathogenesis of *Ashmari* as explained by *Charaka*, *Sushruta* and *Kashyapa* is the same. The idea of the accumulation of precipitate, leading to the formation of *Ashmari* is accepted by all the above authors. Though idea of precipitation is the same yet there is a difference of opinion amongst them regarding the specific *Dosa* responsible for initiating the process of stone formation *Sushruta* gives importance to *Shlesma*, while *Charaka* and *Kashyapa* to *Vayu* in pathogenesis of *Ashmari*.

In the process of pathogenesis *Kashyapa* seems to be more scientific than others as the word "*Khajita*" indicates precipitation similar to that of the precipitation in new earthen pitcher as mentioned by *Acharya Sushruta*.

Further *Kashyapa* is nearer to nucleus or nidus theory when he says that *Sarkaras* are bits of stones resembling particles of gold or mustard seeds that are first formed as the nucleus which ultimately increase in size by agglomeration of several particles to be converted in to *Asmari* ^[52].

Symptomatology

1. Purvarupa (Prodormal Symptoms) of Ashmari: It is a specialty as well as customary in *Ayurveda* to describe prodormal symptoms (*Purva Rupa*) of every disease so that the physician or clinician can recognize the impending disease in its early stage and accordingly plan out the management or

treatment in a scientific way. It is a fact that the disease in the early stages are easily curable^[53] But when the gross symptoms appear the prognosis is usually bad and disease itself is difficult to be cured.

The prodromal (*Purva Rupa*) symptoms of *Ashmari* as described in most of the *Ayurvedic* texts are as follows. Pain in the urinary bladder (*Vasti*), internal urethral orifice (*Vasti Sira*), testis (*Mushka*) and penis (*Shefam*). There is anorexia (*Arochakam*), dysuria (*Mutrakricchra*), fever (*Jwara*) and letharginess. The urine has a foetid odour like the odour emitted from goat's body (*Vastagandhattvam*)^[54].

The nature and intensity of the pain as well as colour of the urine are in accordance with the *Dosa* involved. Patient, who predisposed to urolithiasis (*Ashmari*), evince above symptoms and passed concentrated urine with difficulty^[55]. In addition to above, Acharya Vagabhatta has mentioned that there is distention of bladder also^[56].

General Symptomatology of Ashmari: The description of the symptoms are so accurate that they are in conformity with the descriptions given in modern texts. According to *Susruta*, the symptoms of urinary stone (*Ashmari*) are as follows—Once when the *Ashmari* has actually been formed and subject is affected with stones, there is intense pain in the naval region, urinary bladder, perineal raphe and penis during micturition, occasionally obstruction to the flow of the urine occurs and the urine issuing out from the urethra, like spray, is some times mixed with blood. However, the urine may also be clear like *Gomeda* Gems and at times found to be saturated with sand like particles (*Sikatam*). The patients of *Ashmari* often complain of pain in such other activity like running, jumping, swimming, and riding on horse back or on camel and even while walking^[57].

Charaka described the symptoms of urolith (*Ashmari*) in the following term—When the urinary stone (*Ashmari*) blocks the passage of the urine at the root of urinary bladder (*Vasti*) there is obstruction in the free flow of urine associated with pain in the urinary bladder (*Vasti*), perineal raphe (*Sevani*) and penis (*Mehan*). The urine issues out in slow stream. When the intensity of pain increases particularly in male patient, usually they rub their penis and there is frequent evacuation of urine and stool. If the stone (*Ashmari*) obstruct the urinary passage, effort to evacuate urine causes abrasion/trauma in the urinary tract which results in haematuria. If

however, the stone is dislodged and washed out with the flow of urine then the easy flow of urine is seen. If the stone is disintegrated by *Vayu* in to small pieces, gravels (*Sarkara*) then they pass through the urinary tract along with urine^[58].

The description of symptomatology by *Kashyapa* about the urinary stone in children only in the chapter on *Vedana Adhyaya* as well as in *MutraKricchra Chikitsa Adhyaya*. According to these descriptions if the urine is passed in large volume, mixed with sand (*Sarkara*) and the individual complains of pain at the time of micturition or in case of children, they cry due to pain and get emaciated, then it should be inferred that the individual concerned is suffering from urinary stone (*Ashmari*)^[82]. Further he says that while with the reduction in the size of the *Ashmari*, the patient gets emaciated and with increase in size of *Ashmari* the patients became fatty and obese^[60]. *Sushruta* has further classified the symptomatology of *Ashmari* according to the type of *Ashmari*.

Classification: Acharaya *Sushruta* has described four types of *Ashmari*.

1. Shleshmashmari: People, who take excessive food of *Shleshmal* type, get their *Shleshma Dosa* aggravated. This results in formation of *Shleshmashmari* which in due course of time, increases in size and gets lodged at the mouth of *Vasti* (Internal orifice of the urethra). The flow of the urine is there by obstructed and the pressure exerted on the wall of the bladder by the urine causes a feeling of pain like cutting, incising or pricking. There is sensation of heaviness and felt cold in the urinary bladder (*Vasti*)^[61].

2. Pittashmari: When the *Pitta* interacts with aggravated *Shleshma* it gets vitiated, resulting in the formation of stone which in its usual course increases in size and gets lodged at the mouth of the urinary bladder (*Vastimukha Adhithana*), thus obstructing the urinary flow (*SrotoNirunadhi*). The pressure of this stagnant urine causes pain in the bladder (*Vasti*) and the patient has the feeling of warmth, sucking, burning and throbbing sensation in the *Vasti* like that of *Ushnavata*^[62].

3. Vatashmari: When the *shleshma* get mixed up with *Vata* and assumes a solid form, it is transformed into the stone and gradually increases in size to get lodged at the mouth of *Vasti*. The urinary flow is thus obstructed and the pressure of the stagnant urine causes intense pain and the subject being afflicted with unbearable pain, gnashes his teeth, squeezes the umbilical region, rubs the penis, press the ani and cries in

extreme agony. There is a feeling of burning sensation and passes flatus, urine and stool with difficulty and great exertion.^[63]

4. Shukrashmari: This is usually found in adults due to affliction of seminal fluid^[64].

When a person practices complete abstinence by denying the natural sexual urge for long period or indulges in excessive sexual intercourse, the seminal fluid, instead of following its normal course, diverts to other directions. In this act the seminal fluids get mixed with *Vayu* and accumulated in between the penis and the testicles, where it gradually dried up. The *Shukrashmari* thus formed, blocked the urinary tract which resulted in dysuria, pain in the bladder and oedema on the scrotum. The so called spermolith (*Shukrashmari*) gets disintegrated on massaging the afflicted part and the flow of the urine get resumed.^[65]

Sharkara: Regarding *Sharkara*, while most other authors are in perfect agreement about the genesis, form and transformation. *Kashyapa* has suggested a some what different view. The general description of *Sharkara* as suggested by *Sushruta* is as follows-*Sharkara*, *Sikata* and *Bhasma* are all derived from *Ashmari*. The form and quality of *Sharkara* are similar to those of *Ashmari*, but when *Ashmari* is smaller in size and *Vata* is favourable, then it passes out along with urine. This disintegrated forms of *Ashmari*, affected by the influence of *Vata*, is known as *Sharkara*^[66].

According to *Kashyapa*, *Sharkara* is out come of dysuria, as a result of churning action of *Vayu* on urine. The fine particles like gold-dust and mustered seeds, appearing in the urine, are called *Sharkara*. When they aggregate and increase in size it is converted in to *Ashmari*^[67].

Symptoms of Sarkara: Although *Sushruta* has said at one place that the symptoms of *Sharkara* and *Ashmari* are the same^[68], yet has delineated the characters of the predominant symptoms of *Sharkara* in other place as mentioned below-Feeling of pain in cardiac region, weakness in the thigh, pain in the flanks (*Kucchi Shula*), Shivering sensation, thirst, hiccough or eructation, darkness or shallowness of complexion, weakness and paleness of the body, anorexia and indigestion^[69]. If *Sarkaras* obstruct the lumen of urinary channel the following complications are evident: General weakness, lassitude, emaciation, pain in the flanks, anorexia, paleness in skin, *Ushnavata*, thirst, pain in the cardiac region and nausea^[70].

Physical Characteristics of Ashmari:

According to *Sushruta*, who was the first to classify the *Ashmari* on the basis of the predominant *Dosas*. Clear description was made about the physical characteristics of the different forms of *Ashmari*, in details given below:

- 1. Shleshmashmari:** These *Ashmari* are formed due to aggravation of *Sleshma*, are white in colour, glossy to touch, large in size and oval in shape like the egg of Hen and resembles the colour of flower of *Madhuka*^[71].
- 2. Pittashmari:** This type of *Ashmari* is formed due to aggravation of *Pitta* and by interaction with *Shleshma* are either red, or yellow, or black in colour. It approximates the size of *Bhallataka* seeds or *Bhallataka-Asthi*. Some times it has a colour of Honey^[72].
- 3. Vatashmari:** This type of *Ashmari* formed due to the interaction of *Vata* and *Sleshma* are *Amber* in colour like that of lac or resin (*Syava*), hard to touch, irregular in shape with rough surface. In their appearance they resemble *Kadamba Puspa* with spikes on its surface^[73].
- 4. Shukrashmari:** Since *Shukrashmari* is not a stone in the true sense of the word and is liable to disappear at the site of its location by applying pressure from outside without the possibility of extracting the *Ashmari*, *Sushruta* has not mentioned any thing about its physical characteristics.

Charaka has not differentiated the physical characteristics of the different types of *Ashmari*. He has given a general picture of the *Ashmari* as follows-These *Ashmari* are round bodies in shape with appearance like that of *Kadamba Puspa*, very hard but smooth in touch, sometimes they appear triangular in shape, which are found to be comparatively soft^[74].

Management of Ashmari: In the early stage of *Ashmari* it can be cured by medical treatment but when it has become chronic, the stone has to be removed surgically^[75]. As soon as the prodromal symptoms are seen, treatment can be started. In the *Sthana samsrya* state the prodromal symptoms appeared. At this stage the *Srotovaigunya* is evident as commented by *Dalhana*.

Pain in lumber region, back, then retention of urine and cystitis are the first symptoms noticed when treatment should be started. It is said that treatment of *Ashmari* should be started at this stage and all efforts should be made to cure the disease.

The nature of treatment is *Snehana* and *Swedana*. When the treatment is directed on these lines the etiological factors decline and there will be no further formation of stone occurred, even disease is completely cured^[76].

1. Vataja Ashmari: A medicated Ghrita is indicated for the treatment of *Vataja Ashmari* which is prepared by the decoction of different *Vata Shamak Ausadhi* which is listed below. It is not only used to prepare ghrita only but also used to prepare *Kshar, Yavagu, Kwath, Milk*, to siddha the food materials etc.

Drugs: *Pasanabheda, Vasuka, Vashir, Ashmantak, Shatavar, Gokshuru, Big & small kateri, Kapotabanka (Brahmi), Artgala, Kachchaka, Kasa, Gunja, Vrikshadani, Bhalluka, Varuna, Shakaja, Jaua, Kulathi, Ber and Hirmali.*^[100]

2. Pittaja Ashmari: For Pittaja Ashmari the use of *kshar, Yavagu, Yusa, Kasaya, Milk, Ghrita* and Food are indicated which was treated by the drugs of *Pitta Nashak* group of *Ausadhi* i.e. *Kush, Kasha, Sarpata, Gundra, Itkata, Morata, Pasanabheda, Shatavari, Vidarikanda, Varahikanda, the root of Shali Dhanya, Gokshuru, Shyonaka, Patala, Patha, Patanga, Kuntika, the kwath of punarnawa and Shirisa, Shilajatu, Mulethi, seeds of Neel Kamal, Kakadak, Kheera etc*^[78].

3. Shlesmaja Ashmari : For Kaphaja or Shlesmaj Ashmari the use of *Kshar, Yavagu, Yusa, , milk, food and ghrita*, prepared with *Kapha Nashaka Gana* like *varunadi gana, Guggulu, Ilaichi, Renuka Seed, Kootha Bhadradi, Maricha, Chitraka and Devadaru Usakadi gana etc.*^[79] *Pichukankoladi yoga* is another preparation useful in the treatment of *Ashmari*^[80]. The bones of camel, krouncha bird, donkey, with *Gokshura Tala Moolika, Ajamod, Kadamba moola, Nagara* are powdered and used with warm water or sura-a type of alcohol. It has the property to treat the urolithiasis (*Ashmari*).

Another Kshara Preparation: *Tila Apamarga, Kadali Palasa, Patala, Karaveera* Processed as *Kshara* are useful in *Ashmari*. For the pain in *Asmari* the *Brahmi* is used along with *Amla Rasa dravya* like *Sura, Sauveeraka, Kanjika etc.* *Triphala* boiled with milk, also relieved the pain in *Ashmari*, *Punarnava* can be utilised to good purpose in all the conditions as different preparation. In the fifth and sixth *kriya kala*, the use of *pasana bhedadi ghrita, Kshar, Kasaya etc.*

are used to control and eradicate the disease of urolithiasis (*Ashmari*)

Conclusion: A critical review has been made of the ancient literatures dealing with the problem of *Ashmari Roga*. The anatomy and physiology of the urinary system, according to ancient Acharyas, have also been discussed. It is evident from the Ayurvedic texts that not many descriptions are available about physiology of urinary system. Though the term *Vrikka* (*Kidney*) is mentioned but no clear description is available about its role in the formation of urine. Much emphasis has been given to the *Pakvashaya* (large intestine) and *Vasti* (urinary bladder) in formation of urine. The *Vasti* has been considered as the primary site for various urinary disorders including *Ashmari Roga*. Detail descriptions of etiopathogenesis and clinical presentation of *Ashmari Roga*, according to *Dosas*, are available in Ayurvedic classics. Among various sites of urinary stone diseases only detail descriptions of vesical calculus are found. Precursor of urinary stone disease, *crystalluria* has been described in Ayurveda as *Sharkara*.

In Ayurveda various opinions are found about the involvement of *Dosa* in the formation of *Ashmari Roga*. The great physician Charaka has considered that the *Vata Dosa* plays an important role in formation of *Ashmari* in association with *Pitta* and *Kapha Dosas*. Whereas *Sushruta* has described that *Kapha (Shleshma)* is the important factor for the formation of *Ashmari*, which acts as a nidus and binds with other *Dosas* to form *Ashmari*. The treatment of *Ashmari Roga* includes medical and surgical therapies. Medical therapy consists of *Samshodhana* and *Samshaman Chikitsa* according to *Dosas*.

References

1. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; *Ashmari Chikitsa Adhyaya: Chapter 7, Verse3*, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 340.
2. Thakar, V. J. (1999). *Astangsangrah*, (ED) 1st Ed. Vol. I, Nidanstan; *Mutrghatnidanam Adhyaya: Chapter 9, Verse6*. New Delhi: kendriya ayurveda evam anusandhan parishad S-11, Green park extention Market, p. 608
3. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Sharirstan; *Dhamivyakaran Sharir Adhyaya: Chapter 9, Verse7*, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 218.

4. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse22, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 30.
5. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Sharirsthan; Garbhavyakaran Sharir Adhyaya: Chapter 4, Verse31, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 156.
6. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sharir Sthan; KhudikaGarbhavranti Sharir Adhyaya: Chapter 3, Verse 6, Varanasi:Chaukhamba Krishnadas Academy, Vol. II, p.370.
7. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Viman Sthan; SrotasvimaniyaAdhyaya: Chapter 5, Verse 7, Varanasi:Chaukhamba Krishnadas Academy, Vol. II, p. 174.
8. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Sharirsthan; Dhamnivyakaran Sharir Adhyaya: Chapter 9, Verse12, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 220.
9. Murthy, K. R. Srikantha. (2014). *Astangahrdaya of Vagbhata*, (Ed) 1st Ed. Sutra Sthan; Vastividhi Adhyaya:Vol. I chapter 19, Verse 16.Varanasi : Chaukhambha Krishnadas Academy, p. 241.
10. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sidhi Sthan; Trimarmeeya Adhyaya: Chapter 9, Verse 3, Varanasi:Chaukhamba Krishnadas Academy, Vol. VI, p. 324.
11. Thakar, V. J. (1999). *Astangsangrah*, (ED) 1st Ed. Vol. I,Nidansthan; Mutraghatnidanam Adhyaya: Chapter 9, Verse6. New Delhi: kendriya ayurveda evam anusandhan parishad S-11, Green park extension Market, p. 608
12. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sidhi Sthan; Trimarmeeya Adhyaya: Chapter 9, Verse 4, Varanasi:Chaukhamba Krishnadas Academy, Vol. VI, p. 326.
13. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Sharirsthan; Sharirsankhyavyakaran Sharir Adhyaya: Chapter 5, Verse8, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p.172.
14. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse18-20, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 30.
15. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse36, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 345.
16. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Sharirsthan; Garbhavyakaran Sharir Adhyaya: Chapter 4, Verse 16-17, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 153.
17. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Sharirsthan; Dhamnivyakaran Sharir Adhyaya: Chapter 9, Verse12, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 220.
18. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse18-20, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 30.
19. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 21-23, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 30.
20. Shastri Sudarsana, Upadhyay Yadunandana. (Ed.) (2005). *Madhava Nidan of Sri Madhavkara with Madhukosha Sanskrit Commentary*, Mutraghat Nidan Adhyaya: Chapter 31, Verse1, Varanasi: Chaukhamba Prakashan, Ed. 1, Vol. I, p.555.
21. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 3, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 26.
22. Murthy, K. R. Srikantha. (2014). *Astangahrdaya of Vagbhata*, (Ed) 1st Ed. Nidan Sthan; Mutraghat Nidan Adhyaya:Vol. II, chapter 9, Verse 7.Varanasi : Chaukhambha Krishnadas Academy, p.85.
23. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 3, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 26.
24. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 4, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p.26.
25. Murthy K. R. Srikantha. (2014). *Astangahrdaya of Vagbhata*, (Ed) 1st Ed. Sutra Sthan; Matrashitiya Adhyaya:Vol. I chapter 8, Verse 33.Varanasi : Chaukhambha Krishnadas Academy, p. 130.
26. Murthy K. R. Srikantha. (2014). *Astangahrdaya of Vagbhata*, (Ed) 1st Ed. Sutra Sthan; Matrashitiya Adhyaya:Vol. I chapter 8, Verse 34-35.Varanasi : Chaukhambha Krishnadas Academy, p. 130.
27. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 11, Varanasi: Chaukhamba

- Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 28.
28. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Chikitsa Adhyaya: Chapter 26, Verse 32, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p.477.
 29. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Chikitsa Adhyaya: Chapter 26, Verse 76, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p. 491.
 30. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Chikitsa Adhyaya: Chapter 26, Verse 59, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p. 486.
 31. Tewari, P.V. (Ed.) (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Chikitsa Sthan; Mutrakricha Chikitsa Adhyaya: Chapter 10, Verse 1, Varanasi:Chaukhamba Vishvabharati Oriental Publishers and Distributors, p. 201.
 32. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Dhirghanjiviteeya Adhyaya: Chapter 1, Verse 44, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p. 26.
 33. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutrasthan; Rasavisheshvigyaneeya Adhyaya: Chapter 42, Verse 9, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. I, p. 388.
 34. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Ashtaunindateeya Adhyaya: Chapter 21, Verse 50, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p. 384.
 35. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Ashtaunindateeya Adhyaya: Chapter 21, Verse 50, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p. 384.
 36. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Sutrasthan; RatucharyaAdhyaya: Chapter 6, Verse 12, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. I, p. 81.
 37. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Sutrasthan; RatucharyaAdhyaya: Chapter 6, Verse 38, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. I, p. 91.
 38. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Yajjapurushheeyam Adhyaya: Chapter 25, Verse 45, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p. 437.
 39. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Yajjapurushheeyam Adhyaya: Chapter 25, Verse 46, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p. 438.
 40. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Viman Sthan; SrotasvimaniyaAdhyaya: Chapter 5, Verse 20, Varanasi:Chaukhamba Krishnadas Academy, Vol. II, p. 178.
 41. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Anagatbadha Chikitsa Adhyaya: Chapter 24, Verse 45-46, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 496.
 42. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Viman Sthan; Rasavimaniya Adhyaya: Chapter 1, Verse 21, Varanasi:Chaukhamba Krishnadas Academy, Vol. II, p. 123.
 43. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Sutrasthan; Hitahiteeya Adhyaya: Chapter 20, Verse 19, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. I, p. 220.
 44. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 26, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 31.
 45. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 24, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 31.
 46. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 25, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 31.
 47. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 3, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p.26.
 48. Sharma, P.V. (Ed.) (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 27-28, Varanasi: Chaukhamba Vishvabharati, Oriental Publishers and Distributors, Ed. 1, Vol. II, p. 31.
 49. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Chikitsa Adhyaya: Chapter 26, Verse 33, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p. 478 .
 50. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Chikitsa Adhyaya: Chapter 26, Verse 36, Varanasi: Chaukhamba Krishnadas Academy, Vol. IV, p. 479.
 51. Tewari, P.V. (Ed.) (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Chikitsa Sthan;

- Mutrakricha Chikitsa Adhyaya: Chapter 10, Verse 24-26, Varanasi:Chaukhamba Visvabharati Oriental Publishers and Distributors, p. 205.
52. Tewari, P.V. (Ed.) (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Chikitsa Sthan; Mutrakricha Chikitsa Adhyaya: Chapter 10, Verse 24-26, Varanasi:Chaukhamba Visvabharati Oriental Publishers and Distributors, p. 205
 53. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Sutra Sthan; Mahachatuspad Adhyaya: Chapter 10, Verse 11, Varanasi:Chaukhamba Krishnadas Academy, Vol. I, p.197.
 54. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 5, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 26.
 55. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 6, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 26.
 56. Murthy, K. R. Srikantha. (2014). *Astangahrdaya of Vagbhata*, (Ed) 1st Ed. NidanSthan; Mutraghat Nidan Adhyaya: Vol.II chapter 9, Verse 8.Varanasi : Chaukhambha Krishnadas Academy, p. 85.
 57. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 7, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p.27.
 58. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Adhyaya: Chapter 26, Verse 39, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p. 480.
 59. Tewari, P. V. (Ed) (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Sutra Sthan; Vedana Adhyaya: Chapter 25, Verse 24, Varanasi:Chaukhamba Visvabharati Oriental Publishers and Distributors, p. 55.
 60. Tewari, P. V. (Ed) (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Chikitsa Sthan; Mutrakricha Chikitsa Adhyaya: Chapter 10, Verse 27-28, Varanasi:Chaukhamba Visvabharati Oriental Publishers and Distributors, p. 206.
 61. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 8, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 27.
 62. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 9, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 27.
 63. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 10, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 28.
 64. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 11, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 28.
 65. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 12, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 28.
 66. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 13-14, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 29
 67. Tewari, P. V. (Ed). (2016). *Kashyapa Samhita of Vraddhajivakiya Tantra*, Chikitsa Sthan; Mutrakricha Chikitsa Adhyaya: Chapter 10, Verse 24, Varanasi:Chaukhamba Visvabharati Oriental Publishers and Distributors, p. 205.
 68. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 13, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 29.
 69. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 15-16, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 29.
 70. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 17, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p.29.
 71. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 8, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 27.
 72. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 9, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 27.
 73. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Nidansthan; Ashamari Nidan Adhyaya: Chapter 3, Verse 10, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 28.
 74. Sharma, R. K., Das, V. B. (Ed.) (2016). *Caraka Samhita of Agnivesa*, Chikitsa Sthan; Trimarmeeya Adhyaya: Chapter 26, Verse 37, Varanasi:Chaukhamba Krishnadas Academy, Vol. IV, p. 479.
 75. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa

- Adhyaya: Chapter 7, Verse 3, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 340.
76. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse 4, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 340.
77. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse 5-8, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 340-41.
78. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse 9-13, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 341.
79. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse 14-16, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 341-342.
80. Sharma, P.V. (Ed). (2010). *Sushruta Samhita of Dalhana*, Chikitsasthan; Ashamari Chikitsa Adhyaya: Chapter 7, Verse 17, Varanasi: Chaukhamba Vishvabharati, OrientalPublishers and Distributors, Ed. 1, Vol. II, p. 341.