

**MUTRA UTPATTI; AYURVEDA AND MODERN CONSIDERATION: A  
COMPARATIVE REVIEW****Dr. Rahul Sukhdev Bankar\***

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Article Received on 14/01/2020

Article Revised on 04/02/2020

Article Accepted on 25/02/2020

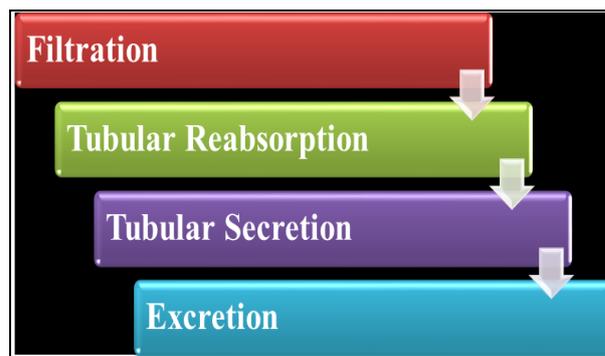
**ABSTRACT**

Ayurveda is considered as Upanga of Atharvaveda which provides ways of healthy living. Ayurveda encompasses several theories related to the maintenance of human health. Ayurveda not only described concepts of diseases and their prevention but it also elaborated concepts of human anatomy, physiology and pathology. In this regards Ayurveda mentioned anatomical and physiological perspectives related to the various system and Mutravaha Samsthana (urinary system) is one of them. The Mutravaha Samsthana involved in formation and excretion of Mutra (urine) means it is related with excretory system. The understanding of physiology of urine is very important to manage various Mutra Roga, considering this aspect the physiology of urine formation was summarized in present article.

**KEYWORDS:** *Ayurveda, Mutra, Mutravaha, Urinary system.***INTRODUCTION**

Ayurveda the ancient system of India described many considerations related to the anatomical and physiological perspective of human body. The physiological knowledge of various system helps to understand their pathological state therefore ayurveda science elaborated anatomical and physiological functionality of different system and urinary system is one of them. There are many diseases related to urinary system (*Mutra Rogas*) such as; *Mutraghaat*, *Mutrakricchra* and *Ashmari*. The management of such disorders requires physiological understanding of *Mutravaha Samsthana*.

Urine formation is one of the important physiological activities of human body in which *Mutravaha Moola* and waste product of *Aahar Rasa* contributes significantly. *Basti*, *Mutravaha Srotansi*, *Vrikka*, *Mutravaha Nadies*, *Mutravaha Dhamanis* and *Mutravaha Sira*, etc. are major body parts which play significant role in the process of urine formation. While modern science described urinary bladder, nephrons, kidney, ureters and urethra, etc. vital parts of urine formations. **Figure 1** depicted important process involved in the formation of urine.

**Figure 1: Important process involved in the formation of urine.****Urine formation as per Ayurveda**

The process mainly occurs in *Antras* the liquid portion of *Ahara* enters into *Pakvashaya* after complete digestion transported to *Basti* with the help of *Nadi's* and excreted out finally. The urine formation takes places after *Sthula Pachana Prakriya* when *Sara* and *Kitta* portions formed from ingested food. The *Kitta* portion converts into *Purisha* and liquid part of *Kitta* converts into *Mutra*. *Pakvashaya* is main organ where formation of *Mutra* takes places, that after it moves to *Basti* and expelled out through *Mootravahasrotasa*, it is believed that *Apaanavaayu* control process of urinary excretion. The whole process carried out inside the body from *Amashaya* to *Pakvashaya*.

### Role of various parts in urine formations

#### ➤ *Vrikka*

It mainly performs functions of urine formation & blood purification thus can be correlates with kidney as per modern science. There are two *Vrikka* inside the body found in lumbar regions at abdominal wall in *Koshtha*. The major process of urine formation and blood filtration take places in *Vrikka* thus it is considered as main organ of urinary system.

#### ➤ *Basti*

It can be correlates with urinary bladder as per modern science and considered as one of *Kosthangas* amongst many inside the body. As per *Susruta Basti* surrounded with *Nabhi*, *Kati*, *Mushka*, *Vakshanas*, *Shepha* and *Guda*. It store and evacuate urine thus play important role in the process of urinary excretion.

#### ➤ *Gavini*

There are two *Gavini* inside the body found both side of *Basti*, they receive *Mutra* coming from *Antras* and circulate it through *Mutrashaya*.

#### ➤ *Mutrapraseka*

*Mutrapraseka* is considered as outlet of *Basti*, which differ in size in male and female. The size of *Mutrapraseka* in female is about two *Angulas* while in male it is twelve *Angulas*. The function of *Mutrapraseka* in male is to carries *Mutra* as well as *Shukra* and in female it carries *Mutra*. *Mutrapraseka* can be correlates with urethra on the basis of functional similarity.

#### ➤ *Mutravaha Srotas (Nephrons)*

*Mutravaha Srotas* performs functioning like micro-channels which carry *Mutra* and considered as Nephrons of modern science. They originate from *Basti* while *Susruta* considered *Medhra* also as roots of *Mutravaha Srotas*.

#### ➤ *Mutravaha Nadis*

*Mutravaha Nadis* are found between of *Pakvashaya* and *Basti* and they perform function of *Mutra Nishyandana* and carry *Mutra* from *Pakvashaya* to *Basti* in normal conditions of relaxation.

#### ➤ *Mutravaha Dhamanis*

*Adhogami Dhamani* move downwards and transport *Mutra* and *Purisha*, they are total three types each of ten in number moving towards *Mutrabasti* to perform function of *Dharana* and *Yapan* of *Mutra*.

#### ➤ *Mutravaha Siras*

These are considered as veins of urinary system carrying *Mutra* to *Basti* since they opens in lateral side of *Basti* and helps in process of *Nishyandana*.

### Urine formation as per modern science

Urine is considered as waste product of body containing urea, uric acid, water, salt and other waste products. The major process occurs inside the kidney in three major

stages; Glomerular Filtration, Tubular Reabsorption and Tubular Secretion.

#### ➤ **Glomerular Filtration**

The process mainly occurs through glomerular capillaries in which blood filtered out to form urine. The high pressure of blood into these capillaries facilitates process of filtration. The protein and blood cells are retained while most of other materials coming with blood circulation reached to Bowman's capsule to form ultrafiltrate with the rate of 125ml/min.

#### ➤ **Tubular Reabsorption**

Some essential substances (potassium, sodium chloride, amino acids, bicarbonate and water) are reabsorbed at tubular part of nephron through passive and active transport. The process of others co-transport also facilitate tubular reabsorption.

#### ➤ **Tubular Secretion**

Peritubular capillaries help to secret ions, substances which not flittered through glomerular filtration like some drugs secreted into the filtrate by process of tubular secretion. The ion exchange also facilitates process of tubular secretion.

The nephron mainly involves in the formation of urine and each nephron is made by renal corpuscle and renal tubule. The renal corpuscle further divided into glomerular capillaries and Bowman's capsule, these organs mainly perform filtration of blood to form urinary fluid. Afferent arteriole brings blood into the glomerulus while efferent arteriole takes blood away from the glomerulus.

The renal tubular parts also divided into various parts; Proximal Convoluted Tubule, Loop of Henle and Distal Convoluted Tubule. The Proximal Convoluted Tubule reabsorbed substances, ions and water. Loop of Henle performs reabsorption and secretion of water while Distal Convoluted Tubule helps in restoration of ions and water.

### CONCLUSION

Ayurveda mentioned detailed description related to *Mutravaha Samsthana* (urinary system) which involved in the formation and excretion of *Mutra*. Urine formation is one of the important physiological activities of human body that removes waste and maintains process of detoxification. The *Aahar Rasa* forms urine after process of digestion and metabolism, the most of the waste fluid excreted through urinary system and improper functioning of this system can cause many health ailments. *Basti*, *Mutravaha Srotansi*, *Vrikka*, *Mutravaha Nadies*, *Mutravaha Dhamanis* and *Mutravaha Sira*, etc. are major body parts which involved in physiological process of urine formations. As per modern science kidney, nephrons, urinary bladder and urethra, etc. are parts which contribute towards the process of urine formations. The knowledge of this process helps physician to understand the pathogenesis of diseases related to urinary system.

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