



Research Article

## A STUDY ON CLASSIFICATION OF *MUTRA-ASHMARI* WITH SPECIAL REFERENCE TO URINE ROUTINE & MICROSCOPIC EXAMINATION

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### ABSTRACT

*Mutrashmari*, according to modern science, the formation of stones in the urinary system is one of the main problems of urology. The study of the ancient surgical text Sushruta Samhita reveals that urological issues are an important part of the medical sciences. It may be the reason that a clear and striking picture regarding their classification, symptomatology, complications, and management is available in all the texts. The important factor, i.e., the diagnostic part in the case of a stone, is that the advice given by ancient Acharyas, who believed that a sure-shot diagnosis is important both for the physician and the patient before proceeding with treatment, appears to be true even today. The disease was not given its own chapter by Acharya Caraka but was explained in the *Mutrakricchra*. Hence this study was taken up for the effective management of *Mutrashmari* vis-à-vis urolithiasis. A minimum of 50 patients suffering from various types of *Mutrashmari* were chosen for the study. The patients have all the features of all four types of *Mutrashmari* according to their *Doshas*. *Vataja Ashmari* was found in 23 of 50 patients, *Slesmaja* in 12 patients, *Pittaja Ashmari* in 15 patients, and *Sukraja Ashmari* in none. The urine routine and microscopic examination method, which is very cost-effective, may prove to be a useful technique in this field. So the research work is to establish the results of urine routine and microscopic examination, which can pave the way for the assessment and diagnosis of different types of *Mutrashmari*.

### INTRODUCTION

*Mutrashmari*, according to modern science the formation of stone in urinary system is one of the main problems of urology. From the study of ancient surgical text Sushruta Samhita, it becomes evident that the urological problems form an important part of medical sciences. It may be the reason that a clear and striking picture regarding their classification, symptomatology, complications and management are available in all the texts.

The important factor i.e., the diagnostic part in case of a stone, the advice given by ancient Acharyas seems to be true even at present, who were of the idea that before going for the treatment sure shot diagnosis is important both for the physician and the patient. Acharya Caraka has not given separate chapter for the disease, but explained it under the *Mutrakricchra*<sup>[1]</sup>.

All the Acharyas except Caraka has classified the disease *Mutrashmari* into four types. Acharya Susruta described as below in Nidan sthana.

चतस्तोऽश्मर्यो भवन्ति श्लेष्माधिष्ठनाः । तद्यथा श्लेष्मणा वातेन पित्तेन शुक्रेण चेति ॥

i.) *Shleshmaja Ashmari* ii.) *Pittaja Ashmari*  
iii.) *Vataja Ashmari* iv.) *Shukraja Ashmari*

Acharya Caraka has considered *Mutrashmari* as a variety under *Mutrakricchra* and classified it into *Mridu Ashmari* and *Kathina Ashmari* on the basis of consistency. *Shukraja*, *Pittaja* and *Kaphaja* varieties are

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*Mridu Ashmari*, where as *Vataja* variety is *Kathina Ashmari*. Different varieties of *Ashmari*, according to

different Acharyas are as in under mentioned table. [2,3,4,5,6,7,8]

**Table 1: According to different Acharyas are as in under mentioned**

S.No.	Ashmari	Su.	A.Hr.	A.S.	M.Ni.	B.P.	Sha.	Y.R.
1.	<i>Shlesmaja</i>	+	+	+	+	+	+	+
2.	<i>Pittaja</i>	+	+	+	+	+	+	+
3.	<i>Vataja</i>	+	+	+	+	+	+	+
4.	<i>Shukraja</i>	+	+	+	+	+	+	+

**Urine Analysis- Routine and Microscopic Examination Review:** Urine is one of the most important diagnostic tool as described in different classics. Based on the information scattered in various texts pertaining to the abnormalities in respect of odour, colour, quantity etc of urine. In this study we have discussed about the material, method, and further findings of urine routine and microscopic examination, as described in urine analysis according to modern science. In modern era, urine analysis is helpful in making the diagnosis of urinary calculus. The urine examination is described in following methods.

- a) Physical Examination
- b) Chemical Examination
- c) Microscopic Examination

**Physical Examination**

- Quantity: Provided by patient
- Colour

1. Normal urine – colourless
2. Dark Yellow- Concentrated urine due to mild dehydration, Vitamin B complex therapy.
3. Cloudy - Presence of phosphates and bacteria
4. Orange - Drug induced.

**• Transparency**

Normal urine - Clear and transparent  
 Amorphous phosphates: Form white sediment in natural or alkaline urine.  
 Presence of Blood: Reddish brown

**Chemical Examination**

In chemical urine examination, chemical parameters were measured by using a commercially available RAPHA A10 reagent dipstick strips. (shown in figure No. 1) This test is relatively inexpensive, and takes less than 5 minutes to complete. Dipstick strips include the following tests:

- pH
- Specific-Gravity
- Protein
- Glucose
- Ketone
- Blood
- Bilirubin
- Urobilinogen
- Leukocytes
- Nitrite



**Figure 1: Dipstick Box**

**Testing Methods**

Dipstick was removed from the air tight, light sealed containers. Each reagent area was immersed in urine by dipping. The excess urine was removed to prevent dilution of reagents or mixing of reagents between pads. This can be achieved by tilting the strip and allowing the urine to run off the edges. While blotting excess urine it was ensured that the chemicals from the different tests do not mix. The reagent pads were read at the specified times. These times were different for each test which was noted in strip. The blocks were compared to the corresponding color chart provided by the test strip's manufacturer.

**Microscopic Examination**

**1. Sample Preparation**

1. Fresh urine sample was obtained
2. 10-15ml of urine at 1500 to 3000 rpm was centrifuge for 5 minutes
3. Supernatant part discarded and remainder of urine was resuspended.
4. 1 drop of urine was placed on slide and cover slip was put on it.

**2. Observation: Haematuria: Causes**

- a) Lesion of kidney: Due to presence of kidney stones
- b) Lesions of lower urinary tract: i. Infection of ureter or ureteric stones ii. Cystitis or bladder stone
- c) **Cells:** Presence or increased R.B.C. and Pus cells
- d) **Crystals: i) Uric acid:** Rosette (Crystals like prism): Presence is suggestive of kidney or bladder stones.

**ii) Calcium oxalate:** (Envelope shaped crystals) : Due to ingestion of cabbage, tomatoes, spinach, asparagus and chocolates in large quantity. If clumped in masses may be due to stones.

**iii) Cystine:** Traces are normal in urine, may be from renal and cystic calculi.

**iv) Phosphates:** In alkalosis.

Now a day, it seems that, most of the people of our society are suffering from disorder of *Mutrashmari*. The examination of urine has always been essential for the diagnosis of disease from medieval time to this modern era of biotechnical development. So work should be done to use such technique which is simple and cost effective also. As the examination of urine gives information about the diagnosis of urolithiasis, this method which is very cost effective may be proved to be useful technique in this field. So research work is to establish results of Urine Routine and Microscopic Examination, which can pave the way for the assessment of diagnosis of different types of *Mutrashmari*. So that, such disorder will be treated properly as per the present circumstances. Therefore a clinical study was carried out about classification of *Mutrashmari* with special reference to urine routine and microscopic examination, with following aim and objective.

#### AIM AND OBJECTIVE

A study on classification of *Mutra-Ashmari* with special reference to urine routine & microscopic examination.

#### MATERIALS AND METHODS<sup>[9,10]</sup>

**Materials:** Diagnosis is made on the basis of special history Proforma prepared for the study in relation to *Mutrashmari*. This research work was approved by the Institutional Ethics Committee of Shubhdeep Ayurved Medical College & Hospital (P.G. Institute), Indore, Madhya Pradesh No.EC/2015/07.

#### Methods

**1. Source of Data:** The patients attended the O.P.D/I.P.D. of Shubhdeep Ayurved Medical College & Hospital, Indore (M.P.), have been randomly selected irrespective of their, sex, religion, race, occupation etc.

**2. Patients Selection:** Minimum 50 patients will be selected for study who is suffering from different types of *Mutrashmari*.

#### 3. Inclusion Criteria

**a.** The patients with all the features of all four types of *Mutrashmari* according to *Doshas*. Out of 50 patients, 23 patients have *Vataja Ashmari*, 12 patients each have *Slesmaja* and 15 *Pittaja* type of *Ashmari*; whereas no patient has *Shukraja Ashmari*.

**b.** Patients age above 14 years and below 50 years.

#### Exclusion Criteria

- Age group- Patients aged below 14 years and above 50 years.

- Patients suffering from- Chronic kidney disease, Pyelonephritis, Nephrotic Syndrome, Diabetic Nephropathy, Poorly Functioning Kidney.
- Associated with diabetes mellitus, hypertension.
- Patients with obstruction in urinary passage.
- Patients undergoing treatment for any other serious illness.
- Malignancy.

#### Plan of Study

**I. Detailed Proforma:** A special proforma was prepared regarding the disease and the patient as a whole. According to Inclusion and Exclusion criteria as explained.

**II. Investigations:** Urine routine and microscopic examination.

**III. Criteria of Assessment:** Assessment of investigation urine routine and microscopic examination was done. Rbcs, Pus cells, epithelial cells parameter of urine microscopic examination was done on scoring technique. The statistical analysis of these scores was done. The detail of the scores adopted in present study were as below:

- Scoring of RBCs in urine microscopic examination:  
No/ occasionally present: 0  
1/ hpf to 5/ hpf: 1  
6/ hpf to 10/ hpf: 2  
11/ hpf to 15/ hpf: 3  
Above 15/ hpf: 4
  - Scoring of Pus cells in urine microscopic examination  
No/ occasionally present: 0  
1/ hpf to 4/ hpf: 1  
5/ hpf to 8/ hpf: 2  
9/ hpf to 12/ hpf: 3  
Above 12/ hpf: 4
  - Scoring of Epithelial cells in urine microscopic examination  
No/ occasionally present: 0  
1/ hpf to 2/ hpf: 1  
3/ hpf to 4/ hpf: 2  
5/ hpf to 6/ hpf: 3  
7/ hpf to 8/ hpf: 4  
Above 8/ hpf: 5
- IV. Statistical Analysis:** The information gathered on the basis of Ayurveda and modern science was subjected to statistical analysis. In this study, all parameters are subjective, the number of group is only one and number of patients is fifty (n=50). Therefore, Pearson Chi-Square test (with Like hood ratio) was carried out at P-value P<0.05, P<0.01, P<0.001 significance level. The obtained result were interpreted as- 1. Insignificant P>0.05  
3. Significant- P <0.05

2. Highly Significant -  $P < 0.01$ ,  $P < 0.001$ .

## OBSERVATIONS AND RESULTS

In the present study, 50 patients of *Mutrashmari* who are already diagnosed as different types of *Mutrashmari* with help of case record format

were registered. The obtain data is discussed table wise under the heading observation. This analysis is based on group frequencies and percentages also study of inter relation between various factors is done.

**Table 2: Urine Colour wise Distribution of 50 patients of *Mutrashmari***

Urine colour	No. of Patients	Percentage
Pale yellow	13	26%
Reddish yellow	09	18%
Yellow	17	34%
Whitish Yellow	11	22%

From the above table it is observed that, out of 50 patients, 13 (26%) patients have Pale yellow urine in colour, 09 (18%) patients have reddish yellow urine in colour, 17 (34%) patients have yellow urine in colour and 11 (22%) patients have yellowish urine in colour.

**Table 3: Urine Reaction (pH) wise distribution of 50 patients of *Mutrashmari***

Urine pH (Reaction)	No. of Patients	Percentage
Acidic	34	68%
Alkaline	07	14%
Normal	09	18%

From the above table it is observed that, out of 50 patients of *Mutrashmari*, 34 (68%) patients have acidic nature of urine, 07 (14%) patients have alkaline nature of urine and only 09 (18%) patients have normal nature of urine.

**Table 4: Specific gravity of urine wise Distribution of 50 patients of *Mutrashmari***

Specific gravity	No. of Patients	Percentage
1.005	01	02%
1.010	07	14%
1.020	11	22%
1.030	31	62%

From the above table it is observed that, out of 50 patients, 31 (62%) patients have 1.030 specific gravity of urine, 11 (22%) patients have reddish 1.020 specific gravity of urine, 07 (14%) patients have 1.010 specific gravity of urine and only 01 (02%) patients have 1.005 specific gravity of urine.

**Table 5: Albumin in urine wise distribution of 50 patients of *Mutrashmari***

Albumin	No. of Patients	Percentage
Nil	18	36%
Slightly traces	24	48%
Traces	08	16%

From the above table it is observed that, out of 50 patients of *Mutrashmari*, 18 (36%) patients have not albumin in urine, 24 (48%) patients have albumin in slightly traces in urine and only 08 (16%) patients have albumin in traces in urine.

**Table 6: Number of Rbcs/hpf in urine wise Distribution of 50 patients of *Mutrashmari***

Range of Rbcs/hpf	No. of Patients	Percentage
No/ Occasionally	05	10%
0 to 5/hpf	26	52%
6 to 10/hpf	18	36%
11 to 15/hpf	1	02%

From the above table it is observed that, out of 50 patients, 05 (10%) patients have no/occasionally Rbcs in microscopic urine examination, 26 (52%) patients have 0 to 5/hpf Rbcs in microscopic urine examination, 18 (36%) patients have 6 to 10/hpf Rbcs in microscopic urine examination and only 01 (02%) patients have 11 to 15/hpf Rbcs in microscopic urine examination.

**Table 7: Number of Pus cells/hpf in urine wise Distribution of 50 patients of *Mutrashmari***

Range of Pus cells/hpf	No. of Patients	Percentage
1 to 4/hpf	20	40%
5 to 08/hpf	20	40%
09 to 12/hpf	09	18%
Above 12/hpf	01	02%

From the above table it is observed that, out of 50 patients, 20 (40%) patients have 1 to 4/hpf pus cells in microscopic urine examination and also 20 (40%) patients have 5 to 8/hpf pus cell in microscopic urine examination, 09 (18%) patients have 09 to 12/hpf pus cell in microscopic urine examination and only 01 (02%) patients have above 12/hpf pus cell in microscopic urine examination.

**Table 8: Number of Epithelial cells/hpf in urine wise Distribution of 50 patients of *Mutrashmari***

Range of Epithelial cells	No. of Patients	Percentage
No/occasionally	02	04%
01 to 02/hpf	18	36%
03 to 04/hpf	19	38%
05 to 06/hpf	07	14%
07 to 08/hpf	04	08%

From the above table it is observed that, out of 50 patients, 02 (04%) patients have no/occasionally epithelial cells in microscopic urine examination and 18 (36%) patients have 1 to 2/hpf epithelial cell in microscopic urine examination, 19 (38%) patients have 03 to 04/hpf epithelial cell in microscopic urine examination, 07 (14%) patients have 05 to 06/hpf epithelial cell in microscopic urine examination and 04 (08%) patients have 07 to 08/hpf epithelial cell in microscopic urine examination.

**Table 9: Urine Crystals wise Distribution of 50 patients of *Mutrashmari***

Types of Crystals	No. of Patients	Percentage
Calcium Oxalate	23	46%
Triple phosphate	09	18%
Uric acid	15	30%
Cystine	03	06%

From the above table it is observed that, out of 50 patients, 23 (46%) patients have calcium oxalate crystals in microscopic urine examination and 15 (30%) patients have Uric acid crystals in microscopic urine examination, 09 (18%) patients have triple phosphate crystals in microscopic urine examination, 03 (06%) patients have cystine crystals in microscopic urine examination.

**Table 10: Cases of *Mutrashmari* vs Urine Colour**

Cases of <i>Mutrashmari</i>	Urine Colour				Total
	Pale yellow	Reddish yellow	Yellow	Whitish Yellow	
<i>Pitaja</i>	2	7	6	0	15
<i>Shleshmaja</i>	1	2	1	8	12
<i>Vataja</i>	10	0	10	3	23
<b>Total</b>	13	9	17	11	50

**Chi-Square Tests**

Statistical Test	Value	df	p-value
<b>Pearson Chi-Square</b>	34.181 <sup>a</sup>	6	.000
<b>Likelihood Ratio</b>	37.024	6	.000
<b>No. of Valid Cases</b>	50		

On statistical analysis, the P value is 0.000. The result is highly significant at  $p < 0.001$ . Though direct relation was present between urine colour and cases of *Mutrashmari*, it was statistically significant.

**Table 11: Cases of *Mutrashmari* vs Urine Reaction**

Cases of <i>Mutrashmari</i>	Urine Reaction			Total
	Acidic	Alkaline	Normal	
<i>Pitaja</i>	15	0	0	15
<i>Shleshmaja</i>	0	7	5	12
<i>Vataja</i>	19	0	4	23
<b>Total</b>	34	7	9	50

**Chi-Square Tests**

Statistical Test	Value	df	p-value
Pearson Chi-Square	39.746	4	.000
Likelihood Ratio	47.063	4	.000
N of Valid Cases	50		

On statistical analysis, the P value is 0.000. The result is highly significant at  $p < 0.001$ . Though direct relation was present between urine reaction and cases of *Mutrashmari*, it was statistically significant.

**Table 12: Cases of *Mutrashmari* vs Urine Specific Gravity**

Cases of <i>Mutrashmari</i>	Urine Specific Gravity				Total
	1.005	1.010	1.020	1.030	
<i>Pitaja</i>	0	0	3	12	15
<i>Shleshmaja</i>	0	0	4	8	12
<i>Vataja</i>	1	7	4	11	23
<b>Total</b>	1	7	11	31	50

**Chi-Square Tests**

Statistical Test	Value	df	p-value
Pearson Chi-Square	11.913	6	.064
Likelihood Ratio	14.864	6	.021
N of Valid Cases	50		

On statistical analysis, the P value is 0.064. The result is not significant at  $p < 0.05$ . The result is insignificant at  $p < 0.05$ .

**Table 13: Cases of *Mutrashmari* vs Urine Albumin**

Cases of <i>Mutrashmari</i>	Urine Albumin			Total
	Nil	Slightly Traces	Traces	
<i>Pitaja</i>	7	6	2	15
<i>Shleshmaja</i>	5	6	1	12
<i>Vataja</i>	6	12	5	23
<b>Total</b>	18	24	8	50

**Chi-Square Tests**

Statistical Test	Value	df	p-value
Pearson Chi-Square	2.483	4	.648
Likelihood Ratio	2.564	4	.633
N of Valid Cases	50		

On statistical analysis, the P value is 0.335. Since the value of 'p' was not nearer to 0.05. The result is insignificant at  $p < 0.05$ .

**Table 14: Cases of Mutrashmari vs Urine Rbcs/hpf**

Cases of Mutrashmari	Urine Rbcs /hpf				Total
	No/Occasionally	1 to 5 /hpf	6 to 10 /hpf	11 to 15 /hpf	
<i>Pitaja</i>	0	6	9	0	15
<i>Shleshmaja</i>	2	8	1	1	12
<i>Vataja</i>	3	12	8	0	23
<b>Total</b>	<b>Total</b>	26	18	1	50

Chi-Square Tests			
Statistical Test	Value	df	<i>p-value</i>
Pearson Chi-Square	11.286	6	.080
Likelihood Ratio	13.117	6	.041
N of Valid Cases	50		

On statistical analysis, the P value is 0.080. The result is in-significant at  $p < 0.05$ . Though direct relation was not present between urine reaction and Cases of Mutrashmari, it was statistically significant.

**Table 15: Cases of Mutrashmari vs Urine Pus Cells /hpf**

Cases of Mutrashmari	Urine Pus Cells /hpf				Total
	1 to 04 /hpf	5 to 8 /hpf	9 to 12 /hpf	> 12 /hpf	
<i>Pitaja</i>	2	10	3	0	15
<i>Shleshmaja</i>	4	5	3	0	12
<i>Vataja</i>	14	5	3	1	23
<b>Total</b>	20	20	9	1	50

Chi-Square Tests			
Statistical Test	Value	df	<i>p-value</i>
Pearson Chi-Square	11.745	6	.068
Likelihood Ratio	12.654	6	.049
N of Valid Cases	50		

On statistical analysis, The P value is 0.068. The result is in-significant at  $p < 0.05$ . Direct relation was not present between urine reaction and cases of Mutrashmari.

**Table 16: Cases of Mutrashmari vs Urine Epithelial Cells/hpf**

Chi-Square Tests			
Statistical Test	Value	df	<i>p-value</i>
Pearson Chi-Square	7.092	8	.527
Likelihood Ratio	8.373	8	.398
N of Valid Cases	50		

On statistical analysis, The P value is 0.527. Since the value of '*p*' was not nearer to 0.05. The result is not significant at  $p < 0.05$ .

**Table 17: Cases of Mutrashmari Vs Urine Crystals**

Cases of Mutrashmari	Urine Crystals				Total
	Cystine	Cystine	Triple Phosphate	Uric Acid	
<i>Pitaja</i>	0	0	0	15	15
<i>Shleshmaja</i>	0	3	9	0	12
<i>Vataja</i>	23	0	0	0	23
<b>Total</b>	23	3	9	15	50

Chi-Square Tests			
Statistical Test	Value	df	p-value
Pearson Chi-Square	100.000	6	.000
Likelihood Ratio	106.090	6	.000
N of Valid Cases	50		

Cases of <i>Mutrashmari</i>	Urine Epithelial Cells/hpf					Total
	No/ Occasionally	1 to 2 cell/hpf	3 to 4 cells/hpf	5 to 6 cells/hpf	7 to 8 cells/hpf	
<i>Pitaja</i>	0	4	9	1	1	15
<i>Shleshmaja</i>	1	5	4	2	0	12
<i>Vataja</i>	1	9	6	4	3	23
<b>Total</b>	2	18	19	7	4	50

On statistical analysis, the P value is 0.000. The result is highly significant at  $p < 0.001$ . Though direct relation was present between urine crystals and Cases of *Mutrashmari*, it was statistically significant.

**DISCUSSION**

- **Urine Colour vs Cases of *Mutrashmari*:** From Table 10, it is observed that, out of 50 patients, 26% patients have pale yellow urine in colour, 18% patients have reddish yellow urine in colour, 34% patients have yellow urine in colour and 22% patients have yellowish urine in colour. From Table No. 18, it is observed that the above data is highly significant statistically. From this study it can be said that pale yellow and yellow colour of urine is directly related to *Vataja Mutrashmari*, reddish yellow and yellow colour of urine is directly related to *Pitaja Mutrashmari*, yellowish colour of urine is directly related to *Shleshmaja Mutrashmari*.
- **Urine Reaction vs Cases of *Mutrashmari*:** From the Table 11, it is observed that, out of 50 patients of *Mutrashmari*, 68% patients have acidic nature of urine, 14% patients have alkaline nature of urine and only 18% patients have normal nature of urine. The above data is highly significant statistically. From this Study, it can be said that acidic nature urine is directly related to *Vataja* and *Pittaja Mutrashmari* and alkaline nature and normal nature of urine is directly related to *Shleshmaja Mutrashmari*.
- **Urine Specific Gravity vs Cases of *Mutrashmari*:** From the Table 12, it is observed that, out of 50 patients, 62% patients have 1.030 specific gravity of urine, 22% patients have reddish 1.020 specific gravity of urine, 14% patients have 1.010 specific gravity of urine and only 02% patients have 1.005 specific gravity of urine. From this study, most of the cases having normal specific gravity of urine. So, it can be said that there is no direct relation between specific gravity of urine and *Mutrashmari*.

But in complicated cases of *Mutrashmari*, Specific gravity may be less than normal which is a subject of further study.

- **Urine Albumin vs Cases of *Mutrashmari*:** From the Table 13 it is observed that, out of 50 patients of *Mutrashmari*, 36% patients have not albumin in urine, 48% patients have albumin in slightly traces in urine and only 16% patients have albumin in traces in urine. According to above data, it can be said that there is no direct relation between Urine Albumin and *Mutrashamri*. Because, most of the cases having slightly traces or absent Albumin in urine.
- **Urine Rbcs/hpf vs Cases of *Mutrashmari*:** From the Table No. 14 it is observed that, out of 50 patients, 10% patients have no/occasionally Rbcs in microscopic urine examination, 52% patients have 0 to 5/hpf Rbcs in microscopic urine examination, 36% patients have 6 to 10/hpf Rbcs in microscopic urine examination and only 02% patients have 11 to 15/hpf Rbcs in microscopic urine examination. According to this study, it can be said that most of the patients having 01 to 10 /hpf Rbcs in urine. So, it is proved that there is direct relation between Rbcs in urine and *Mutrashamri*.
- **Urine Pus cells/hpf vs Cases of *Mutrashmari*:** From the Table No.15, it is observed that, out of 50 patients, 40% patients have 1 to 4/hpf pus cells in microscopic urine examination and also 40% patients have 5 to 8/hpf pus cell in microscopic urine examination, 18% patients have 09 to 12/hpf pus cell in microscopic urine examination and only 02% patients have above 12/hpf pus cell in microscopic urine examination. From this study, it can be said that, there is direct relation between Urine pus cell and *Mutrashmari*.
- **Urine Epithelial cells/hpf vs Cases of *Mutrashmari*:** From the Table No.16, it is observed that, out of 50 patients, 04% patients have



no/occasionally epithelial cells in microscopic urine examination and 36% patients have 1 to 2/hpf epithelial cell in microscopic urine examination, 38% patients have 03 to 04/hpf epithelial cell in microscopic urine examination, 14% patients have 05 to 06/hpf epithelial cell in microscopic urine examination and 08% patients have 07 to 08/hpf epithelial cell in microscopic urine examination. From this study, it still needs a higher number of patients to come on a probable inference.

- **Urine Crystals/hpf vs Cases of *Mutrashmari*:** From the Table No. 17, it is observed that, out of 50 patients, 46% patients have calcium oxalate crystals in microscopic urine examination and 30% patients have Uric acid crystals in microscopic urine examination, 18% patients have triple phosphate crystals in microscopic urine examination, 06% patients have cystine crystals in microscopic urine examination. Above data is significant statistically. According to above data it can be said that the Calcium oxalate Crystals is directly related to *Vataja Mutrashmari* and uric acid crystals is directly related to *Pittaja Mutrashmari* and triple phosphate and cystine crystals is directly related to *Shleshmaja Mutrashmari*.

#### CONCLUSION

- In urine physical examination, pale yellow colour of urine is directly related to *Vataja Mutrashmari*, reddish yellow and yellow colour of urine is directly related to *Pitaja Mutrashmari*, whitish yellow colour of urine is directly related to *Shleshmaja Mutrashmari*.
- In urine physical examination acidic nature urine is directly related to *Vataja* and *Pittaja Mutrashmari* and alkaline nature and normal nature of urine is directly related to *Shleshmaja Mutrashmari*.
- In urine microscopic examination, calcium oxalate crystals is directly related to *Vataja Mutrashmari* and uric acid crystals is directly related to *Pittaja Mutrashmari* and Triple phosphate and cystine crystals is directly related to *Shleshmaja Mutrashmari*

Finally it may be concluded that Urine Routine and Microscopic Examination can be used as a tool for assessing the type of *Mutra-Ashmari* and severity of diseases to plan the treatment. This simple technique

may also be helpful in diagnosis and prognosis of this disease. But it requires observations in large number of cases. Since no other laboratory test is available to instantly assess or forecast the diagnosis of this diseases, this method which is very cost effective may be proved to be useful technique in this field.

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