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A PHYSIOLOGICAL STUDY TO EVALUATE THE EFFECT OF IKSHU RASA IN MUTRAKSHAYA

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ABSTRACT

Mutrakshaya is a common urinary disorder characterized by decreased urine output and difficulty in urination. The present study aimed to evaluate the effect of Ikshu Rasa, a traditional Ayurvedic formulation, in the management of Mutrakshaya. A randomized controlled trial was conducted on 40 patients with Mutrakshaya. The patients were randomly assigned to either the treatment group, receiving Ikshu Rasa with water, or the control group, receiving plain water. The primary outcome measure was the improvement in urine output. Secondary outcomes included changes in serum Hb level, and electrolyte balance.

KEYWORD: Ikshu Rasa, Mutrakshaya.

INTRODUCTION

Mutrakshaya is a common urinary disorder that is characterized by decreased urine output and difficulty in urination. It is considered a Vata-Kapha dominant disorder in Ayurveda. Ikshu Rasa, a traditional Ayurvedic formulation, has been used to treat urinary disorders. The aim of the present study was to evaluate the effect of Ikshu Rasa in the management of Mutrakshaya.

According to Acharya Charak :***इक्षुर्मूत्रजननानाम***(च.सु. २५/४०)

Ikshu knonwn as best of among Mutrajanana dravyas.

Need of study-Till of now no significant research work has been done regarding effect Ekshu Rasa on Mutra Mutra Kshaya.

Description about mutra KshayaIs available in Ayurvedic text, but in scattered manner here and there.

AIMS AND OBJECTIVES

The present study will be undertaken with the following aims and objectives.

- To screen and compile all available literature on mutrakshaya in ayurvedic textas well as modern text.
- To study the effect of Ikshu Rasa on Mutrakshaya.
- To study the physiology of mutravaha Srotas and related mutrakshaya

Criteria for the selection of cases Essential

1. Mutra alpata
2. Mutra Vaivarnya

Non Essential

1. Mutra Krichhra
2. Mutra Daha
3. Basti toda
4. Sharirik Durbalta
5. Sarv Sharir Rukshata
6.Pipasa

Inclusion Criteria

1. Clinically volunteers age between 20-40 years.
2. With no Pre-existing medical condition.
3. Person currently taking no medication.
4. Total Urine output in 24 hours< 600ml.

Exclusion Criteria

1. Age below 20 years and above 40 years.
2. Person having any systemic disorders and renal diseases.
3. Pregnant and lactating women.
4. Person who is not willing to continue this trial.

Investigation

Urine examination (physical) 1. Colour 2. Clearity 3. Volume (Total quantity of Urine in 24 hours.)

Serum Hb

Serum Na+

Serum K +

Serum Cl-

Type of Study: Observational.

Period of Study: Total duration of clinical trial is 12 days.

Sample Size: Minimum 40 volunteers.

Funding and Sponsor Agency: State Ayurvedic College and Hospital, Lucknow.

OBSERVATIONAL STUDY

According to aim and object of observational study of "A PhysioClinical study to evaluate the effects of Ikshu Rasa on Mutrakshaya" is completed according to the statement of Acharya Charak and Sushruta. So this observational study is completed according to the Ayurveda's and Modern vision. Clinical feature which is described by Acharya are given below.

1. Mootra Alpata
2. Mootra Vayvarna
3. Mootra Kruchya
4. Mootra Daah
5. Basti Toda
6. Sharirik Durbalta
7. Sarva Sharir Rukshata
8. Pipasa

Modern investigation

1. Urine physical examination
2. Urine 24 hr output
3. Haemoglobin
4. Electrolytes - Na+ K+ -Cl-

In observational study, researcher completed work examine the Volunteers concerning the above sign and symptoms described by the Acharya Charak and Sushruta. In the related section of observational study data of the observation has been displayed in two sections and in this section that data would be analyzed and discussed with proper logic.

RESULTS

Table No. 1: Intergroup Comparison of Mootra Alpta.

Table No. 1 : Intergroup Comparison of Mootra Alpta

Mootra Alpta	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	20	100.0%	20	100.0%	NA	NA
3rd day DT	18	90.0%	17	85.0%	0.23	0.633
6th day DT	15	75.0%	13	65.0%	0.48	0.490
9th day DT	12	60.0%	8	40.0%	1.60	0.206
12th day DT	10	50.0%	5	25.0%	2.67	0.102

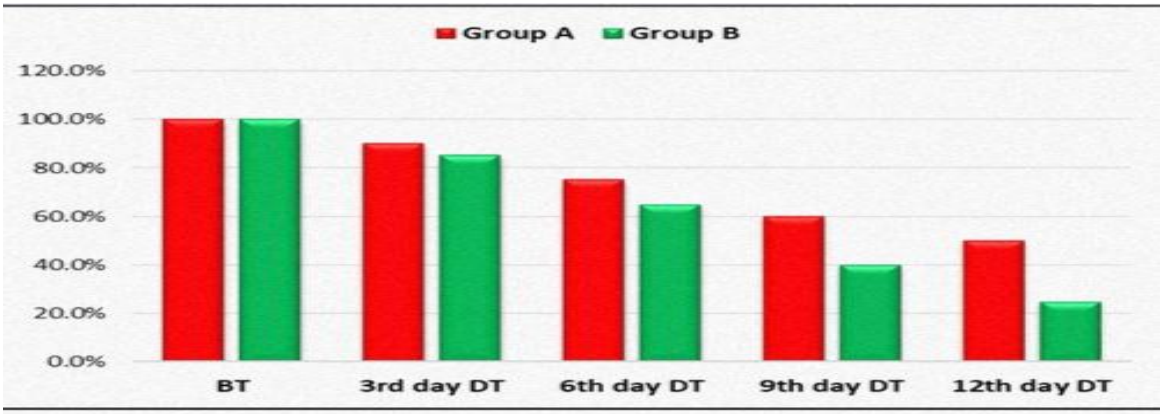


Table No. 2: Intergroup Comparison of Mootra Vayvarna.

Table No. 2 : Intergroup Comparison of Mootra Vayvarna

Mootra Vayvarna	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	20	100.0%	20	100.0%	NA	NA
3rd day DT	18	90.0%	17	85.0%	0.23	0.633
6th day DT	15	75.0%	14	70.0%	0.13	0.723
9th day DT	11	55.0%	9	45.0%	0.40	0.527
12th day DT	8	40.0%	5	25.0%	1.03	0.311

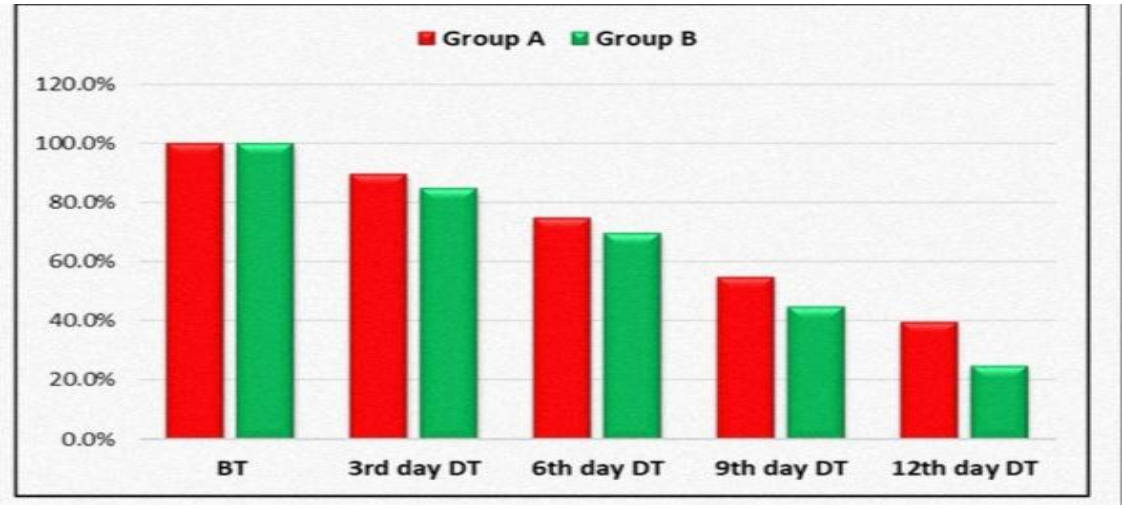


Table No. 3: Intergroup Comparison of Mootra Kruchya.

Table No. 3 : Intergroup Comparison of Mootra Kruchya

Mootra Kruchya	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	18	90.0%	19	95.0%	0.36	0.548
3rd day DT	15	75.0%	14	70.0%	0.13	0.723
6th day DT	13	65.0%	11	55.0%	0.42	0.519
9th day DT	11	55.0%	8	40.0%	0.90	0.342
12th day DT	8	40.0%	4	20.0%	1.91	0.168

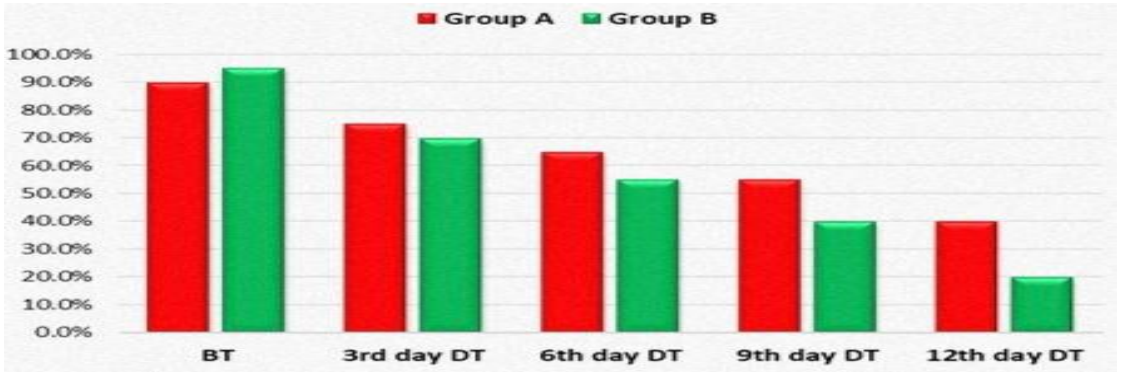


Table No. 4: Intergroup Comparison of Mootra Daah.

Table No. 4 : Intergroup Comparison of Mootra Daah

Mootra Daah	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	16	80.0%	17	85.0%	0.17	0.677
3rd day DT	14	70.0%	14	70.0%	0.00	1.000
6th day DT	12	60.0%	11	55.0%	0.10	0.749
9th day DT	9	45.0%	7	35.0%	0.42	0.519
12th day DT	6	30.0%	3	15.0%	1.29	0.256

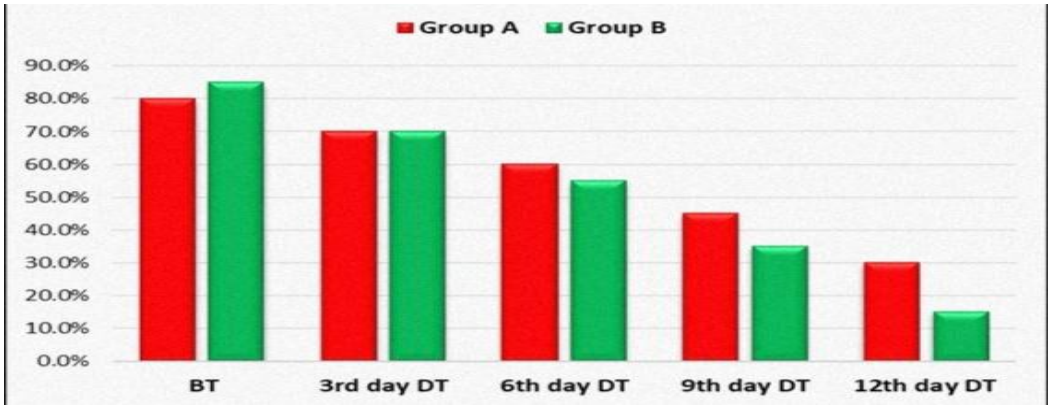


Table No. 5: Intergroup Comparison of Basti Tod.

Table No. 5 : Intergroup Comparison of Basti Tod

Basti Tod	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	19	95.0%	19	95.0%	0.00	1.000
3rd day DT	16	80.0%	15	75.0%	0.14	0.705
6th day DT	13	65.0%	11	55.0%	0.42	0.519
9th day DT	10	50.0%	7	35.0%	0.92	0.337
12th day DT	8	40.0%	4	20.0%	1.91	0.168

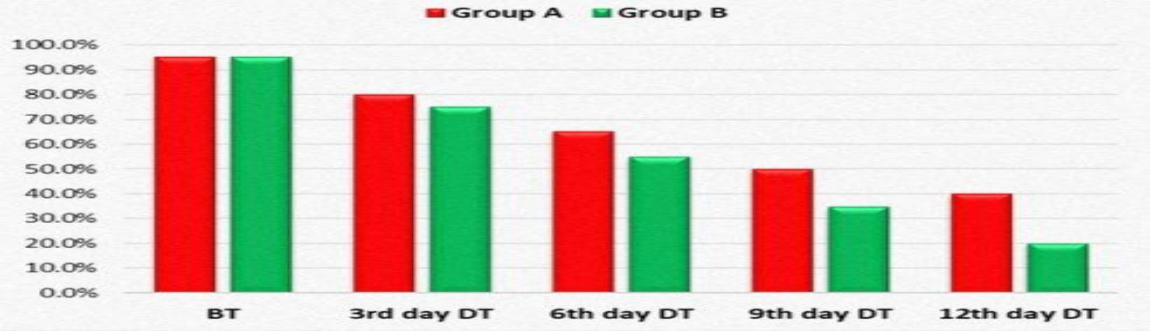


Table No. 6: Intergroup Comparison of Sharirik Durbalta.

Table No. 6 : Intergroup Comparison of Sharirik Durbalta

Shaaririk Durbalta	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	16	80.0%	14	70.0%	0.53	0.465
3rd day DT	14	70.0%	11	55.0%	0.96	0.327
6th day DT	11	55.0%	7	35.0%	1.62	0.204
9th day DT	8	40.0%	3	15.0%	3.14	0.077
12th day DT	4	20.0%	0	0.0%	4.44	0.035

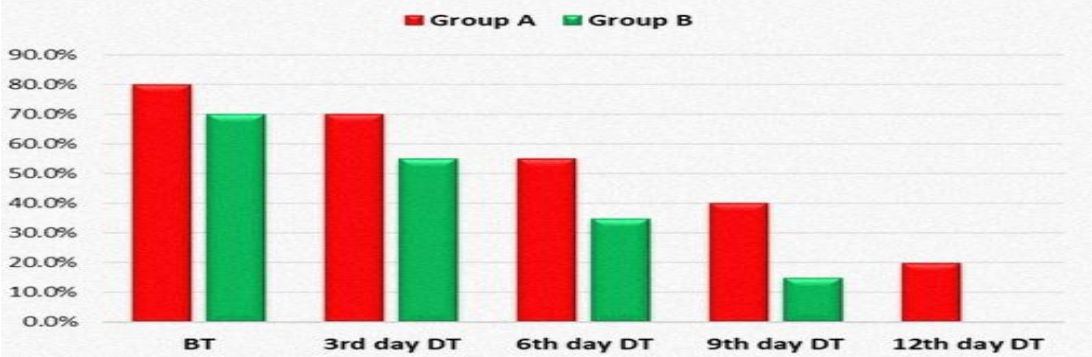


Table No. 7: Intergroup Comparison of Sarva Shareer Rukshta.

Table No. 7 : Intergroup Comparison of Sarva Shareer Rukshta

Sarv Shareer Rukshta	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	18	90.0%	18	90.0%	0.00	1.000
3rd day DT	15	75.0%	14	70.0%	0.13	0.723
6th day DT	12	60.0%	10	50.0%	0.40	0.525
9th day DT	9	45.0%	7	35.0%	0.42	0.519
12th day DT	6	30.0%	3	15.0%	1.29	0.256

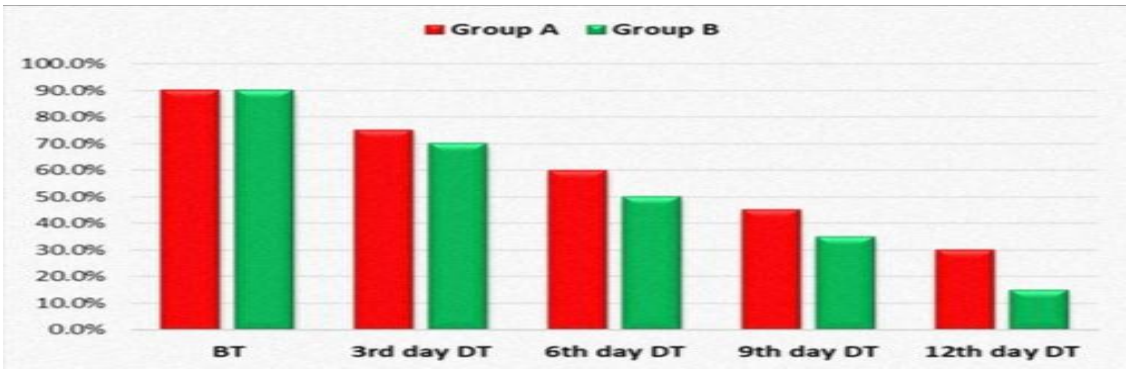


Table No. 8: Intergroup Comparison of Pipaasa.

Table No. 8 : Intergroup Comparison of Pipaasa

Pipaasa	Group A		Group B		chi sq	p-value
	No Present	% Present	No Present	% Present		
BT	16	80.0%	16	80.0%	0.00	1.000
3rd day DT	13	65.0%	11	55.0%	0.42	0.519
6th day DT	10	50.0%	7	35.0%	0.92	0.337
9th day DT	7	35.0%	3	15.0%	2.13	0.144
12th day DT	4	20.0%	0	0.0%	4.44	0.035

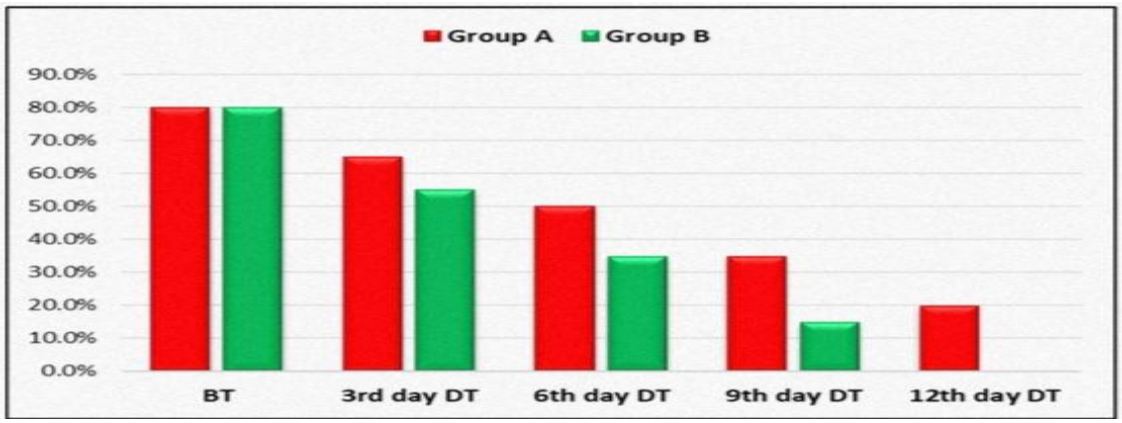


Table No. 9: Intergroup Comparison of 24 hr Urine Output.

Table No. 9 : Intergroup Comparison of 24 hr Urine Output

24 hr Urine Output	Group A		Group B		Unpaired t Test	
	Mean	SD	Mean	SD	t-value	p-value
BT	441.7	119.8	476.5	109.2	-0.96	0.343
3rd day DT	552.2	118.5	590.2	111.8	-1.04	0.304
6th day DT	670.3	125.9	703.8	109.6	-0.90	0.375
9th day DT	882.9	122.9	914.7	109.2	-0.87	0.392
12th day DT	1103.1	147.3	1126.3	108.1	-0.57	0.574

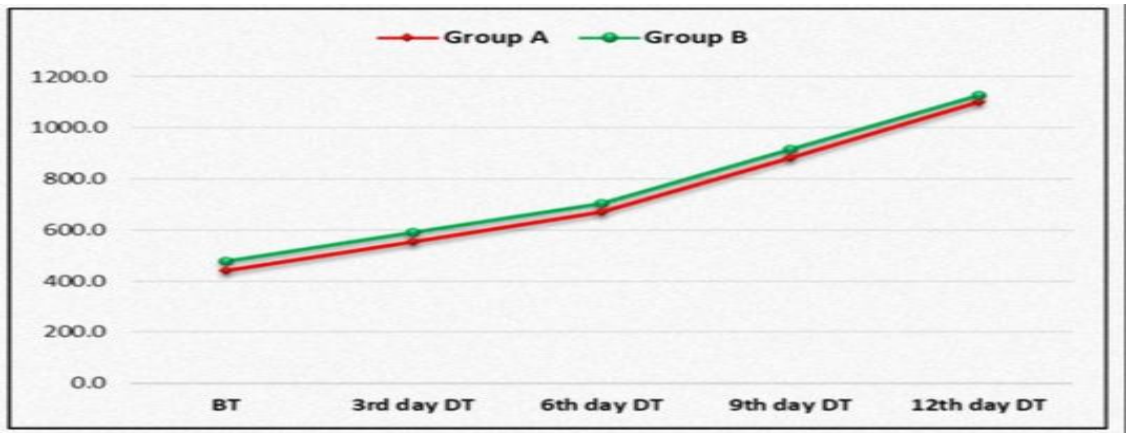


Table No. 10: Intergroup Comparison of Hb Level.

Table No. 10 : Intergroup Comparison of Hb Level

Hb	Group A		Group B		Unpaired t Test	
	Mean	SD	Mean	SD	t-value	p-value
BT	10.5	1.5	10.3	1.3	0.40	0.694
3rd day DT	10.5	1.5	10.5	1.5	-0.04	0.967
6th day DT	10.6	1.4	10.6	1.3	0.00	1.000
9th day DT	10.6	1.4	10.8	1.3	-0.44	0.663
12th day DT	10.8	1.5	10.8	1.4	0.03	0.974

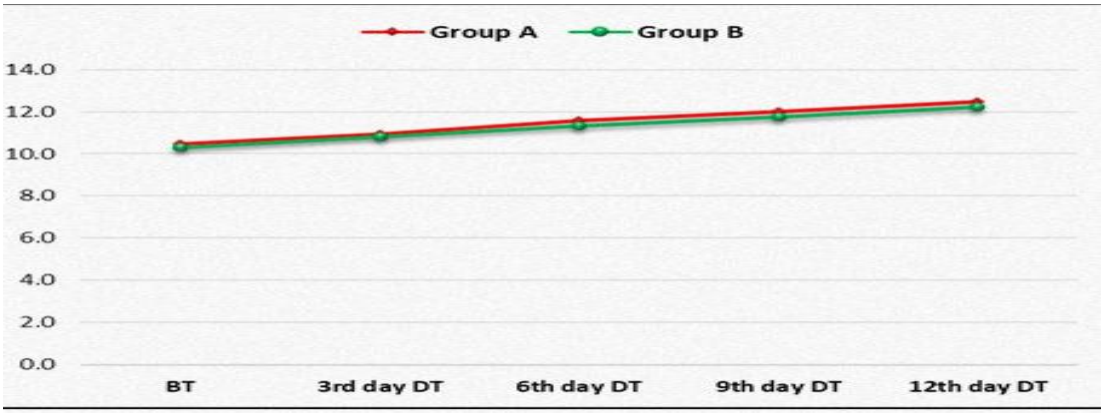


Table No. 11: Intergroup Comparison of Na Level.

Table No. 11 : Intergroup Comparison of Na Level

Na	Group A		Group B		Unpaired t Test	
	Mean	SD	Mean	SD	t-value	p-value
BT	133.6	4.2	134.0	3.3	-0.34	0.739
3rd day DT	134.7	4.2	135.2	3.2	-0.39	0.702
6th day DT	136.5	4.0	136.3	2.8	0.18	0.857
9th day DT	138.3	4.2	137.7	2.9	0.57	0.575
12th day DT	140.3	3.3	140.2	2.7	0.05	0.959

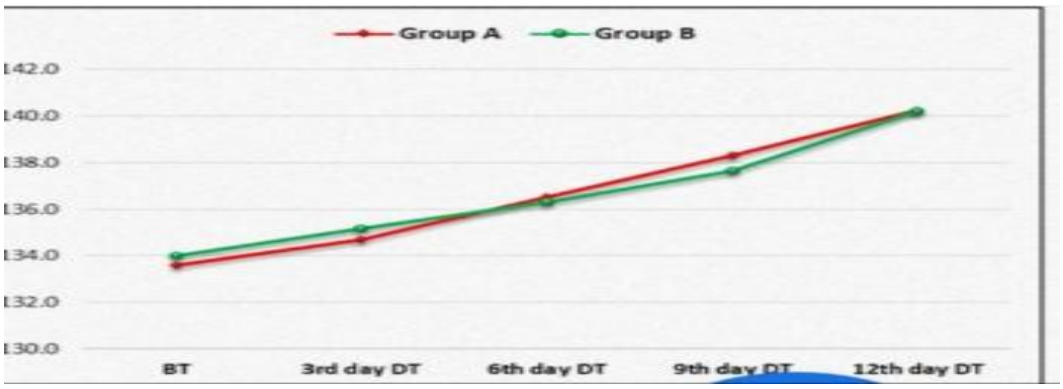


Table No. 12: Intergroup Comparison of K Level.

Table No. 12 : Intergroup Comparison of K Level

K	Group A		Group B		Unpaired t Test	
	Mean	SD	Mean	SD	t-value	p-value
BT	2.5	0.8	2.5	0.8	-0.02	0.985
3rd day DT	3.0	0.7	3.0	0.7	-0.20	0.845
6th day DT	3.5	0.7	3.4	0.6	0.10	0.924
9th day DT	3.9	0.7	3.9	0.5	0.36	0.724
12th day DT	4.5	0.5	4.4	0.5	0.86	0.394

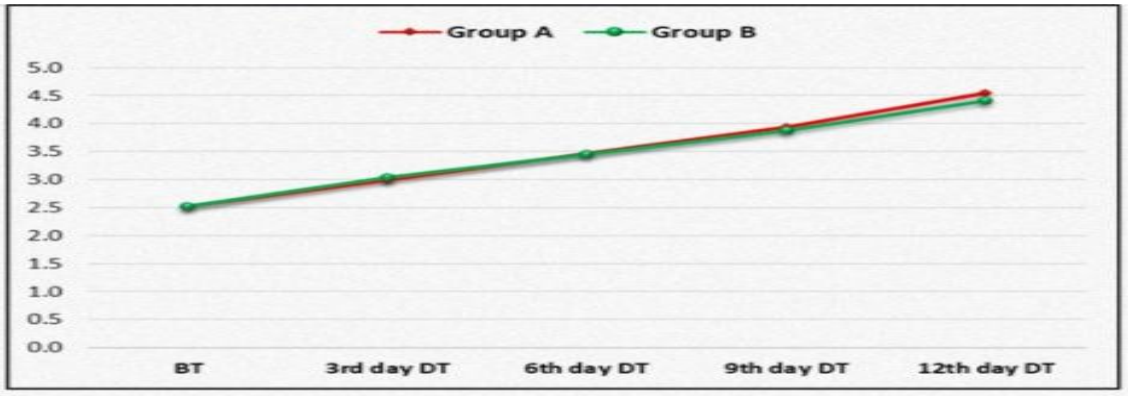
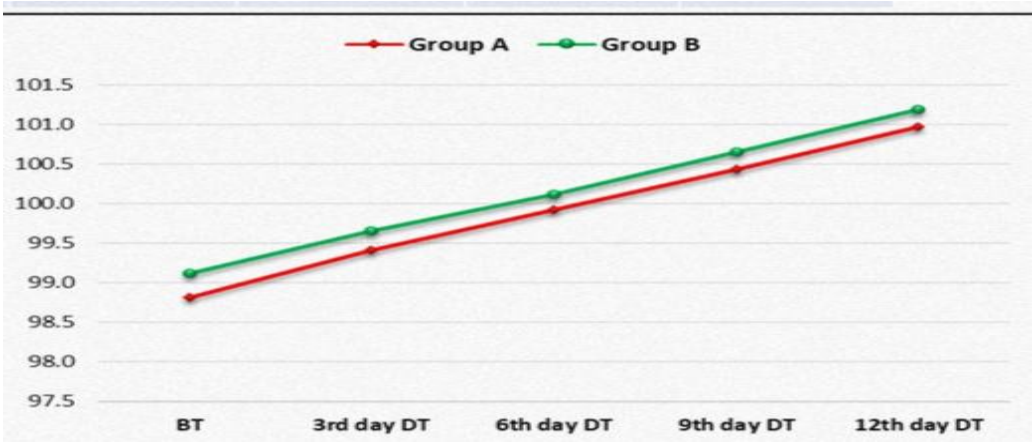


Table No. 13: Intergroup Comparison of Cl Level.

Table No. 13 : Intergroup Comparison of Cl Level

Cl	Group A		Group B		Unpaired t Test	
	Mean	SD	Mean	SD	t-value	p-value
BT	98.8	3.4	99.1	3.1	-0.29	0.771
3rd day DT	99.4	3.3	99.7	3.1	-0.24	0.813
6th day DT	99.9	3.3	100.1	3.1	-0.19	0.850
9th day DT	100.4	3.3	100.7	3.2	-0.22	0.829
12th day DT	101.0	3.1	101.2	3.1	-0.23	0.817



DISCUSSION

In group A, the **Mootra Alpta** was present in 100% cases at BT, which was reduced to 90% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Alpta was present in 50% cases only. In group B, the Mootra Alpta was present in 100% cases at BT, which was reduced to 85% at 3rd day of DT and further reduced onwards, finally at 12th day

of DT Mootra Alpta was present in 25% cases only. No significant difference was found in proportion of Mootra Alpta between the groups from BT to 12th day DT (p>0.05)

In group A, the **Mootra Vayvarna** was present in 100% cases at BT, which was reduced to 90% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Vayvarna was present in 40% cases only. In group B, the Mootra Vayvarna was present in 100% cases at BT, which was reduced to 85% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Vayvarna was present in 25% cases only. No significant difference was found in proportion of Mootra Vayvarna between the groups from BT to 12th day DT (p>0.05).

In group A, the **Mootra Kruchy**a was present in 90% cases at BT, which was reduced to 75% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Kruchya was present in 40% cases only. In group B, the Mootra Kruchya was present in 95% cases at BT, which was reduced to 70% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Kruchya was present in 20% cases only. No significant difference was found in proportion of Mootra Kruchya between the groups from BT to 12th day DT (p>0.05).

In group A, the **Mootra Daah** was present in 80% cases at BT, which was reduced to 70% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Daah was present in 30% cases only. In group B, the Mootra Daah was present in 85% cases at BT, which was reduced to 70% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Mootra Daah was present in 15% cases only. No significant difference was found in proportion of Mootra Daah between the groups from BT to 12th day DT (p>0.05)

In group A, the **Basti Tod** was present in 95% cases at BT, which was reduced to 80% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Basti Tod was present in 40% cases only. In group B, the Basti Tod was present in 95% cases at BT, which was reduced to 75% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Basti Tod was present in 20% cases only. No significant difference was found in proportion of Basti Tod between the groups from BT to 12th day DT (p>0.05).

In group A, the **Shaaririk Durbalta** was present in 80% cases at BT, which was reduced to 70% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Shaaririk Durbalta was present in 20% cases only. In group B, the Shaaririk Durbalta was present in

70% cases at BT, which was reduced to 55% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Shaaririk Durbalta was not present in nay case. No significant difference was found in proportion of Shaaririk Durbalta between the groups from BT to 9th day DT (p>0.05). However **significant difference was found at 12th day DT.**

In group A, the **SARV Shareer Rukshta** was present in 90% cases at BT, which was reduced to 75% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Sarv Shareer Rukshta was present in 30% cases only. In group B, the Sarv Shareer Rukshta was present in 90% cases at BT, which was reduced to 70% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Sarv Shareer Rukshta was present in 15% cases only. No significant difference was found in proportion of Sarv Shareer Rukshta between the groups from BT to 12th day DT (p>0.05).

In group A, the **Pipaasa** was present in 80% cases at BT, which was reduced to 65% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Pipaasa was present in 20% cases only. In group B, the Pipaasa was present in 80% cases at BT, which was reduced to 55% at 3rd day of DT and further reduced onwards, finally at 12th day of DT Pipaasa was not present in any case. No significant difference was found in proportion of Pipaasa between the groups from BT to 9th day DT (p>0.05), however **significant difference was present at 12th day DT (p=0.035).**

At BT, the mean 24hr **urine output** of group A was less than the group B. However no significant difference was present (p=0.343). At 3rd day DT, the mean 24hr urine output of group A was less than the group B. However no significant difference was present (p=0.304). At 6th day DT, the mean 24hr urine output of group A was less than the group B. However no significant difference was present (p=0.375). At 9th day DT, the mean 24hr urine output of group A was less than the group B. However no significant difference was present (p=0.392). At 12th day DT, the mean 24hr urine output of group A was less than the group B. However no significant difference was present (p=0.574).

At BT, the mean **Hb level** of group A was more than the group B. However no significant difference was present (p=0.694). At 3rd day DT, the mean Hb level of group A was more than the group B. However no significant difference was present (p=0.967). At 6th day DT, the mean Hb level of group A was more than the group B. However no significant difference was present (p=1.000). At 9th day DT, the mean Hb level of group A was more than the group

B. However no significant difference was present (p=0.663). At 12th day DT, the mean Hb level of group A was more than the group B. However no significant difference was present (p=0.974).

At BT, the mean **Na level** of group A was less than the group B. However no significant difference was present (p=0.739). At 3rd day DT, the mean Na level of group A was less than the group B. However no significant difference was present (p=0.702). At 6th day DT, the mean Na level of group A was less than the group B. However no significant difference was present (p=0.857). At 9th day DT, the mean Na level of group A was less than the group B. However no significant difference was present (p=0.575). At 12th day DT, the mean Na level of group A was less than the group B. However no significant difference was present (p=0.959).

At BT, the mean **K level** of group A was equal to the group B. No significant difference was present (p=0.985). At 3rd day DT, the mean K level of group A was equal to the group B. No significant difference was present (p=0.845). At 6th day DT, the mean K level of group A was more than the group B. However no significant difference was present (p=0.924). At 9th day DT, the mean K level of group A was equal to the group B. No significant difference was present (p=0.724). At 12th day DT, the mean K level of group A was more than the group B. However no significant difference was present (p=0.394).

At BT, the mean **Cl level** of group A was less than the group B. However no significant difference was present (p=0.771). At 3rd day DT, the mean Cl level of group A was less than the group B. However no significant difference was present (p=0.813). At 6th day DT, the mean Cl level of group A was less than the group B. However no significant difference was present (p=0.850). At 9th day DT, the mean Cl level of group A was less than the group B. However no significant difference was present (p=0.829). At 12th day DT, the mean Cl level of group A was less than the group B. However no significant difference was present (p=0.817).

The present work entitled **"A Physio-Clinical study to evaluate the effects of Ikshu Rasa on Mutrakshaya"** has been undertaken to launch a study of Ikshu and its characterisation along with therapeutic evaluation of its efficacy in patients of Mutrakshaya. IKSHU (Saccharum officinanum) is mentioned in Ayurvedic texts, ex.- Bhav Prakash described Ikshu and given 13 species of Ikshu. Also Acharya Sushruta- Ikshu contains Madhur rasa

(sweet in taste), Sara, Snigdha, Guru guna, Sheeta veerya, Madhur vipaka,. Bhav Prakash – It is also act as control haemorrhages, enhance body strength and act as aphrodisiac. Promote Kapha dosha, sweet in taste and Post digestive effect demulcent, heavy to digest, diuretic coaling. All these properties make it suitable to combat Mutrakshaya.

According to Sushruta – Madhur, Madhur vipak, Guna sheeta, Snigdha balya, vrishya, mutrala, Raktapitta prashmanah. The sheeta gune of Ikshu helps in Mutrakshaya. In present study we have found that in Group A the parameters Mootra Alpata, Mootravayvarna, Mootra Daha, Basti Toda, Sharirik durbalta, Sarva Sharir Rukshata, Pipasa showed some improvement while while Mootrakrichhya showed significant improvement whereas in group B Mutra Alpata, Mutra Vaivarnya, Mutra daha, Basti Toda, Sharirik Durbalta, Sarva Sharir Rukshata, Pipasa showed significant improvement with comparison to group A while Mootra krichhya, showed no significant improvement with comparison to group B. Now we have finally found that after discussion on various parameters there is no significance differences in between group A and group B (p=0.50) . The study is time bound and short term trial and has many limitations. The present study is a part of educational programme and presents the Methodology and observations only.

Probable mode of action of Ikshu: According to Acharya Charak some drug act by Rasa, some by virtue of Veerya of Guna or Vipaka or sometimes impowered by Prabhava (Ch.Sut. 26/21). He also says about drug action that some drugs act by its own Prabhava (i.e. dravya prabhava), some act by virtue of guna (Guna prabhava) and some act Jointly by virtue of both thair own and guna (Dravyaguna prabhava) (Cha.su. 26/13). Ikshu is having Madhur rasa, Sara, Snigdha, Guru guna, Sheeta veerya, Madhur vipaka which is Mutral. Through the number of cases selected for the present study were not sufficient to draw any specific conclusion, but is has certainly paved a path for further probe in this research work. It can be safely said that this work is a pilot work from the complete project which reveals that the hypothesis Ayurvedists laid about 3000 years back is still important from diagramis prognosis of the patient.

CONCLUSION

- Urine is Mala of Ahara. Pitta which is situated between Pakwashaya and Amashaya by invisible mechanism, digest four types of food and drinks, separates Dosha, Rasa, Urine and faces.

- Vata, Pitta together invading the bladder make for the decrease of the Urine associated with Pain and burning sensation is called as Mutrakshaya.
- The middle class families are badly affected due to stressful life style and inadequate intake of liquid diet.
- The Trial therapy done by a safe herbal dravya (Ikshu) and It's act not only upon Mutrakshaya but on a variety of factors by increasing Jala Mahabhuta because of it's Sheeta and Madhur guna. It helps to control "Mutrakshaya"
- Result suggest possibility of more productive outcome. If Ikshu use along with different dravyas which is described by Acharya Charak (varuni, Manda, Madhu, Lavana dravya etc.) and liquid diet may help to combat Mutrakshaya.
- By the virtue of Sara, Snigdha, Guru guna, Sheet veerya, Madhur vipaka Ikshu increase the quantity of Mutra. Thus it is proved from the above discussion that Ikshu (saccharum officinarum) has the necessary properties and actions to combat Mutrakshaya.
- All the findings have been discussed rationally and scientifically in the chapter of discussion, finally we inferred that Ikshu has the Mutral properties but it shows the mild improvement on Mutrakshaya.
- This was pilot study performed in limited time with limited resources exploration of its other related aspects in language of modern science is a subject of further research. We hope that this pilot study will be helpful for the researchers in year to come.

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