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A Clinico-Pathological Study on *Pleehodara* w.s.r. to Splenomegaly and its Comparative Management with *Sarapunkha Kshara* and *Sarapunkha Ghana Vati*

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ABSTRACT:

Introduction- *Udara rogas* are classified into 8 types according to different *Acharyas. Pleehodara* is one among them.The main cause behind the development of *Udara roga* is '*Mandagni'*. In *Ayurveda Pleehodara* may be correlated with Splenomegaly. *Sarapunkha* a herbal drug mentioned in *Ayurveda* classics is effective in *Pleehodara*. So, a comparative single blind study of *Sarapunkha Kshara* and *Sarapunkha Ghana Vati* are taken into consideration for clinical trial for present study.

Aims: To study about the comparative clinical efficacy of *Sarapunkha Kshara* and *Sarapunkha Ghana Vati* in the management of *Pleehodara***.**

Material and Methods- This is a single-blind comparative clinical study with a pre-test and post-test design. The patients were Randomly categorised into two groups.30 patients of Group-A(15) and Group-B(15) patients were registered from OPD and IPD of Govt. Ayurvedic College and Hospital, Balangir presented with Subjective parameters and Objective Parameters. After diagnosis they were under trial with *Ayurvedic* formulations of *Sarapunkha Kshara* given 500mg twice daily after food in Group A and *Sarapunkha Ghana Vati* given 2tab (1 tab-500mg) twice daily after food with luke warm water for a period of 30 days respectively. The subjective and objective parameters were assessed in 10 days interval to interpret the result by statistical evaluation.

Observation and Results: It had been observed that the result of trial drug Group-A patients was significant (<0.05) to reduce both subjective and objective Parameters after 30 days of treatment as compare to Group-B patients.

Conclusion: On comparison between two groups, *Sarapunkha Kshara* had shown more effect than *Sarapunkha Ghan Vati.* No adverse effects were noticed during clinical trial in both groups.

Keywords– *Udara roga, Pleehodara*, Spleen, Splenomegaly

INTRODUCTION

Ayurveda names three elemental substances, the *Doshas*(called *Vata*,*Pitaa and Kapha)*, and states that a balance of the *Doshas* results in health, while imbalance results in disease.In case of *Udara roga, Mandagni* plays

an important role for the development of this disease. *Indigestion*, excessive accumulation of vitiated *Doshas* for a long period, taking unclean foods and the retention of *Mala, Mutra,* etc are the factors for developing *Udara Roga*[1].*Brihatrayee* and other *Acharyas* classified *Udara Roga* into 8 types. *Pleehodara* is one among them.Excessive consumption of *Vidahi, Abhisyandi Ahara* leads to Vitiation of *Kapha and Rakta* . As a result of accumulation of Vitiated *Kapha* and *Rakta*, the *Pleeha* gets enlarged and called it as *Pleehodara*[2]. Splenomegaly is an enlargement of the spleen. The spleen has to be two and a half times its normal size to become palpable, though an enlarged spleen is not always palpable[3]. An enlarged spleen may cause abdominal discomfort, accompanied by back pain and abdominal bloating and early satiety due to stomach compression.

Many *Kalpanas* are seen in various classical book of *Ayurveda. Kshara Kalpana*[5] is one among them. The process of preparation of *Kshara* involves the extraction of Alaklies from the ash of the dried plants[8].It is said that the diseases which are difficult to treat can be treated by *Kshara* therapy. Another formulaton named as *Ghana Vati* of individual drug also helps to treat diseases of various conditions and found remarkable result.In view of the above fact a clinical trial of *Sarapunkha Kshara* and *Sarapunkha Ghana Vati*, were taken as research profile in 30 patients in two equal groups to treat *Pleehodara*.

AIMS AND OBJECTIVE OF THE STUDY

- To study the comparative effect of *Sarapunkha kshara* and *Sarapunkha Ghana Vati* in the management of Pleehodara.
- To findout the effective treatment of *Pleehodara in Ayurveda*.
- To correlate *pleehodara* described in Ayurveda with modern parlance.

MATERIALS AND METHODS

IEC Number- 1143/G.A.C & H Dated 20/05/2020
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Selection of patients

This is a Single-blind comparative clinical study with a pre-test and post test design. The patients were Randomly categorised into two groups. The total 30 patients (Group-A 15, Group-B 15) had been selected by a special proforma covering demography along with both Subjective and Objective parameters from OPD and IPD of Govt. Ayurvedic College and Hospital, Balangir and Saradeswari Govt. Ayurvedic Hospital Balangir.The consent of patient was also taken before clinical trial.

Diagnosis criteria:

The patient were diagnosed on the basis of subjective parameter and objective parameter for the diagnosis of Pleehodara[4]. The subjective parameter were *Dourbalya, Arochaka, Swasha, Avipaka, Mrudu jwara, Varcha mutra graham, Karshya, Angamarda* and objective parameter were Hbgm%, TLC, ESR and Reticulocyte Count

Inclusion Criteria

- Patients between age group 12-50 years irrespective of sex.
- Patients having clinical features of *Pleehodara* (splenomegaly).
- Malaria, Typhoid, Sickle cell anemia patient having splenomegaly features were taken into consideration also.

Exclusion Criteria

- Patients less than 12 years & more than 50 years
- Pregnant women and lactating mother
- Ascites
- Carcinoma of spleen
- Having frequent blood transfusion
- HbSS crisis
- Malignancies
- Chronic splenomegaly(palpable below umbilicus)

Selection Of Drugs

Two medicines *Sarapunkha Kshara* and *Sarapunkha Ghana Vati* had been taken for clinical trial. The drug Sarapunkha of both medicines was identified by the experts of Dept. of *Dravyaguna* which was approved by DRC and IEC of Govt. Ayurvedic College & Hospital, Balangir, and Sambalpur University.

Medicines were prepared as per GMP certified method in Mini Pharmacy of College under the supervision of expert of *Rashasashtra & Bhaisajya Kalpana*. The sample of research medicines were sent to Quality control Laboratories of ALN Rao Memorial Ayurvedic Medical College & PG Centre Koppa, Dist. Chikmagalur, Karnataka for Analytical study.The pharmacodynamics of *Sarapunkha* is mentioned in Table No-01.

Dose-

Group-A : Patients were advised to take *Sarapunkha Kshara* 500 mg twice daily after food with luke warm water

Group-B : *Sarapunkha Ghana Vati* 2tab twice daily(1tab-500mg) after food with luke warm water.

Assessment Criteria-

The subjective and objective parameters as per inclusion

criteria were assessed by the grading score from 0 to 3 according to the severity of disease and favorable shift to back. Both parameters were followed up 10^{th} ,20^{th} and 30^{th} day of medication. Table No-02:Showing the assessment of subjective and objective parameters.

OBSERVATION AND RESULT

The clinical study period of 30 patients were taken from 16.07.2021 to 31.01.2022. Within aforesaid period the demography(Table No-3) based on Age-Sex-marital status,etc. along with incidence of *Dasavidha Parikshya*(Table No-04) were observed and assessed.

The subjective and objective parameters of both Group-A and Group-B were observed during clinical study.The percentage of improvement were also

observed and assessed after clinical trial (Table No-05)

After observation of subjective and objective parameters, the statistical analysis of parameters was assessed by the helping statistical method (Table No-06)

DISCUSSION

Due to *Mandagni*, all diseases occurs. In case of *Udara roga*,*Mandagni* plays an important role for the development of this disease. *Brihtrayees* and other *Acharyas* classified *Udara Roga* into 8 types. *Pleehodara* is one among them. *Pleehodara* can be correlated with Splenomegaly. The description of the disease *Pleehodara* is found since *Samhita* period. The detail of *Pleehodara* was discussed in the form of *Nidana*(Causative factor), *Rupa*(symptoms), *Samprapti*(Pathogenesis) and treatment which are described in various classical books. All these features were taken into consideration for this study as well as aetiology, pathogenesis, clinical features and treatment described in Modern science were also followed during research work.

The aim of present study was to study the effect of *Sarapunkha Kshara* and *Sarapunkha Ghana Vati* on *Pleehodara.* Sarapunkhawas selected from *Bhavaprakasha* . The whole study was performed in two groups i.e., 1. Group-A treated with *Sarapunkha Kshara* 500mg twice daily after food with Luke warm *water* and 2. Group-B treated with *Sarapunkha Ghana Vati* 2tab(1tab-500mg) twice daily after food with Luke warm water.

Discussion on Demographic incidence:

Data collected in present disease in age group of 12 to 50 years was studied. In these age group mostly chronic Anemia, malaria, which are prime causes for origin of splenomegaly. It observed in this study majority of patients i.e. 17 (56.67%) were found female group and then 13(43.33%) were male group. In present study 40% patients were married while remaining 60% were unmarried. From the study is seen that the younger and adult mainly suffer from this disease. This can be due to their lifestyle, and any disease history. In unmarried patients infectious, bacterial, chronic anemia history are also found. In present study most of the patients registered were Labour i.e. 56.67%. it may be due to majority of Labour patient coming to OPD. Relation of any occupation is not seen behind the occurrence of *Pleehodara*(splenomegaly). In present study maximum patients i.e. were taking (96.67%) mixed diet. Any type of diet whether vegetarian or non-vegetarian does not have any direct link to produced *Pleehodara* (splenomegaly) but extra fat of meat which may lead to *Agni Dushti*, constipation and pain. In present study maximum patient i.e. 50.00% patient taking the tea& coffee. In present study maximum number of patients have found abnormal bowel habit (76.67%).The abnormal bowel may be due to *mandagni*. Due to *mandagni* the food particles doesn't digested properly as a result constipation occurs**.** Maximum numbers of patient 30(100%) of this study were from *jangala desha*. This doesn't give any relation with the incidence of disease because the study was conducted mostly in the *jangala desha*. In this study majority of the patients i.e. 60% had disturbed sleep. This may be due to *Vata prakopa* and unstable mind in *Pleehodara.*

Discussion on *Dasavidha Parikshya*:

It was observed that maximum number of patients were having *Pitta-Kaphaja prakriti* with the predominance of *Madhyama Bala-Satwa-Sara-Samhanana-Satmya-Pramana- Vyayamashakti- Madhyama Vaya and Avara Ahara Shakti.*

Discussion on Subjective & objective parameter (Graph 1&2)

Daurbalya: In Group A the percentage of effect was 40.91% and in Group B the percentage of effect was 35.71%. The P value for both the groups is <0.05.Hence both the groups are significant but in comparison Group A shows more significant result than Group B.

Avipaka: In Group A the percentage of effect was 40.74% and in Group B the percentage of effect was 17.39%.The P value for both the groups is <0.05.Hence both the groups are significant but in comparison Group A shows more significant result than Group B.

Angamarda: In Group A the percentage of effect was 31.25% and in Group B the percentage of effect was 38.46%.The P value for both the groups are significant but

in comparison Group B shows more significant result than Group A.

Karshya: In Group A the percentage of effect was 29.41% and in group B the percentage of effect was 30%.The P value for the groups are significant but in comparison Group B shows more significant result than Group A.

Jwara: In Group A the percentage of effect was 100% and in Group B the percentage of effect was 100%.The P value for Group A is <0.05 which is significant whereas p value for Group B is >0.05 which is non significant.

Swasha: In Group A the percentage of effect was 33.33% and in Group B the percentage of effect was 0%.The P value for both the groups is >0.05.Hence both groups are non significant.

Pipasa: In Group A the percentage of effect was 44.44% and in Group B the percentage of effect was 25%.The P value for Group is <0.05 which is significant whereas P value for Group B is >0.05 which is non significant. Hence Group A shows more significant result.

Aruchi: In Group A the percentage of effect was 50% and in Group B the percentage of effect was 50%.The P value for Group A is <0.05 which is significant whereas P value for Group B is >0.05 which is non significant. Hence Group A shows more significant result .

Varchamutragraha: In Group A the percentage of effect was 50% and in Group B the percentage of effect was 30%.The P value for Group A is <0.05 which is significant whereas P value for Group B is >0.05 which is non significant. Hence Group A shows more significant result.

Hepatomegaly: In Group A the percentage of effect was 66.67% and in Group B the percentage of effect was 33.33%.The P value for Group A is <0.05 which is significant whereas P value for Group B is >0.05 which is non significant.Hence Group A shows more significant result.

Splenomegaly: In Group A the percentage of effect was 74.07% and in Group B the percentage of effect was 52.17%. The P value for both the group is <0.05.Hence both the groups are significant but in comparison Group A shows more significant result than Group B.

TLC: In Group A the percentage of effect was 57.89% and in Group B the percentage of effect was 42.86%.The P value for both the group is <0.05.Hence, both the groups are significant but in comparison Group A shows more significant result than Group B.

ESR: In Group A the percentage of effect was 19.05% and in Group B the percentage of effect was 9.43%.The P value for both the group is <0.05.Hence,both the group are significant but in comparison Group A shows more significant result than Group B.

Hb%: In Group A the percentage of effect was 35.29% and in Group B the percentage of effect was 17.65%.The P value for Group is <0.05 which significant whereas P value for Group B is >0.05 which is non significant. Hence Group A shows more significant result .

Reticulocyte Count: In Group A the percentage of effect was 18.18% and in Group B the percentage of effect was 25%.The P value for both the groups are non significant.

Probable mode of action:

Sarapunkha(Tephrosia purpurea) as a key medicine to tackle with this problem due to presence of *Laghu-Rukshya-Tikshna Guna,Tikta-Kashaya Rasa, katu Vipaka, Ushna Virya* and specifically it has *Pleehaghna Prabhava*. *Sarapunkha* has *Ushna Virya* due to which penetrates into the spleen and which helps in healing inflammation of Splenomegaly. *KatuVipaka* provide *Deepana Pachana* property which helps in metabolism function to avoid any infection. It is *Vata Kapha Shamaka. Vatahara due* to *Ushna Virya , Kapha Shamaka* due to *KatuVipaka* and *Tikta Kashyaya Rasa.* Due to presence of *Tikshna Guna* it acts as an *Anulomana*(prokinetic) and *Pittasaraka.*

Kashyaya rasa and *Tikshna-Ushna Guna* causes *Shoshana* and *Bhedana* of *Pleeha* that provides contraction of *pleeha* and helps in reducing its size and symptoms. It acts on *Rasa* and *Rakta Dhatu*. *Pleeha* is the *Moolasthana* of *Rakta Dhatu*. Hence it causes blood purification action.

The phytochemical investigations on Tephrosia pururea have revealed the presence of glycosides, Alkaloid, Triterpenoides, Tannins, rotenoids, isoflavones, flavonoids, chalcones. The Flavanoids has been reported to have anti-pyretic, anti-inflammatory, spleen-hepatoprotective &microbial properties.

The overall assessment showed in Table No-08 revealed that In Group A, 40.00% patients had moderate improvement, while 53.33% patients had mild improvement and in Group-B, 73.33% patients had mild improvement. Table No.08: Showing clinical assessment of Result in Group-A and Group-B

In assessing overall effect of therapy,(Graph 3) it was seen that Overall comparison showed that the best results was obtained in Group-A(*Sarapunkha Kshara*) in form of better clinical response and statistical significance. Present study reveals that *Sarapunkha Kshara* has potential effect on *Pleehodara* with the added advantage of being free from side effects.

CONCLUSION

Total 30 patients were registered for the study; and all of them turn up for follow up. Hence clinical study was carried out on 30 patients. The outcome of clinical study was significant statistically in intergroup comparison. On comparison between two groups, *Sarapunkha Kshara* have shown more effect than *Sarapunkha Ghana Vati*. Both the Selected formulations showed better results with its *Pleehaghna Prabhava*, *Vata-Kapha-Shamaka*, Ushna Virya, Tikshna Guna and *Dipana-Pachana* properties. The positive point observed during the study that, there were no side effects seen during the trail, which is really a good sign to the patients and is of vital importance in view of the global acceptance of *Ayurveda*. Encourage all to *Pleehodara* patient should avoid Udaka and *Anupa Mamsa,Shaka,Pishtakrita, Tila,Vyayama, Divaswapna Yana,Ushnaahara, Lavana*, and *Amla, Vidahi foods,Guru and Toya.*

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Table No-01: Showing the Pharmacodynamics of drugs of *Sarapunkha Kshara* and *Sarapunkha Ghana Vati*

Name	***Rasa***	***Guna***	***Veerya***	***Vipaka***	***Doshakarmata & Prabhava***	**Quantity taken**
SARAPUNKHA KSHARA						
Sarapunkha	*Tikta Kasaya*	*Laghu, Ruksha Tikshna*	*Ushna*	*Katu*	*Kapha Vata shamaka*	35kg
SARAPUNKHA GHANA VATI						
Sarapunkha	*TiktaKasaya*	*Laghu RukshyaTikshna*	*Ushna*	*Katu*	*Kaphavata shamaka*	70kg

Table No-02:Showing the assessement of subjective and objective parameters:

ILLNESS	**SEVERITY**	**GRADE**
Karshya	BMI<16KG/M^2	3
	BMI- 16-17 KG/M^2	2
	BMI- 17-18.5 KG/M^2	1
	BMI-18.5-25 KG/M^2	0
Daurbalya	Present in resting condition	3
	Present after Moderate to heavy work	2
	Present after little work	1
	Absent	0
Angamarda	Patient cannot do its normal work	3
	Patient is able to do routine work but have to take some rest	2
	Patient can do his/her normal work	1
	Not present	0
Jwara	high fever (more then 103^0F)	3
	Moderate fever (100.5^0F to 103^0F)	2
	Mild fever (98.6^0F to 100.4^0F)	1
	Absent	0
Swasha	Present in resting condition	3
	Present after a little work	2
	Present after a moderate to heavy work	1
	Absent	0
Pipasa	Always feeling of thirsty after intake of required amount of water	3
	Persistence of dryness after drinking of 3-3.5 litre of water	2
	Dryness of mouth, tongue and in throat region	1
	Not present	0
Aruchi	Patient Taking Meal Only Once In A Day	3
	Feeling Of Hunger In 8-10 Hours After Taking First Meal	2

	Feeling Of Hunger In 5-6 Hours After Taking First Meal	1
	Patient Having Usual Hunger	0
Avipaka	Feeling Of Heaviness In Abdomen & Unable To Take Meal.	+++
	Feeling Of Heaviness In Abdomen Most Of Times And Hardly Ask To Take Meal 1-2times/Day	++
	Feeling Of Heaviness Sometimes	+
	Not Present	0
Varcha Mutra Graha	Always Constipated And Difficult To Micturate In A Week	3
	2-3 Times In A Week	2
	Present Occasionally	1
	Not Present	0
Liver	3 Finger	3
	2 Finger	2
	1 Finger	1
	Not Palpable	0
Spleen	3 Finger	3
	2 Finger	2
	1 Finger	1
	Not Palpable	0
Hb%	6 -7.4 Gm%	3
	7.4 - 8.5 Gm%	2
	8.5-10 Gm%	1
	>10 Gm%	0
Reticulocyte Count	>4	3
	2-4	2
	0.5-2	1
	<0.5	0
Tlc (4000-11000/Cumm)	>13500/Cu Mm	3
	12000-13500/Cu Mm	2
	10500-12000/Cu Mm	1
	4500-10500/Cu Mm	0
Esr	>30mm/Hr	3
	21-30mm/Hr	2
	11-20mm/Hr	1
	<10mm/Hr	0

Table No-03: Demographic incidence of Registered patients.(n=30)

Sl. No.	**Criteria**	**Maximum Percentage**	**Category**
01	**Age**	40.00%	21-30 Years
02	**Sex**	56.67%	Female
03	**Marital status**	60.00%	Unmarried
04	**Educational qualication**	86.67%	Literate
05	**Socio economical status**	90.00%	Middle class
06	**Occupation**	56.67%	Labour
07	**Desha**	100.00%	*Jangala*
08	**Dietary habit**	96.67%	Mixed
09	**Addiction**	50.00%	Taking Tea& Coffee
10	**Sleeping Habit**	60.00%	Disturbed sleep
12	**Urination**	56.67%	*Samyak*
13	**Bowel habit**	76.67%	Abnormal

Table No-04:Incidence of *Dasavidha Parikshya* of Registered patients.(n=30)

Sl. No.	**Criteria**	**Maximum Percentage**	**Category**
01	*Prakriti*	73.33%	*Pittakaphaja*
02	*Vikriti*	100.00%	*Madhyamabala Vyadhi*
03	*Sara*	73.33%	*Madhyamasara Purusha*
04	*Samhanana*	60.00%	*Madhyama*
05	*Pramana*	83.33%	*Madhyama*
06	*Satva*	86.67%	*Madhyama*
07	*Satmya*	70.00%	*Madhyama*
08	*Ahara Shakti*	53.33%	*Abara Ahara Shakti*
09	*Vyayama Shakti*	56.67%	*Madhyama Vyayama Shakti*
10	*Vaya*	100.00%	*Madhyama Vaya*

Table No-05: Total Patients as per disease and Percentage of improvement in Group-A and Group-B (n=30) in both subjective and objective parameter.(n=30)

Subjective and objective Parameter	**Group A**		**Group B**		**Group A**	**Group B**
	Frequency	**Percentage(%)**	**Frequency**	**Percentage(%)**	**% of improve.**	**% of improve.**
Avipaka	15	100.00%	15	100.00%	40.74	17.39
Dourbalya	12	80.00%	11	73.33%	40.91	35.71
Angamarda	10	66.67%	10	66.67%	31.25	38.46
Karshya	10	66.67%	9	60.00%	29.41	30.00
Jwara	4	26.67%	3	20.00%	100.00	100.00
Swasha	2	13.33%	1	6.67%	33.33	0.00
Pipasa	7	46.67%	4	26.67%	44.44	25.00
Aruchi	10	66.67%	5	33.33%	50.00	50.00
Varchamutragraha	10	66.67%	8	53.33%	50.00	30.00
Hepatomegaly	6	40.00%	6	40.00%	66.67	33.33
Splenomegaly	15	100.00%	15	100.00%	74.07	52.17
TLC	13	86.67%	11	73.33%	57.89	42.86
ESR	15	100.00%	15	100.00%	19.05	9.43
Hb%	11	73.33%	14	93.33%	35.29	17.65
Reticulocyte Count	10	66.67%	11	73.33%	18.18	25.00

Table No-06: Showing the Statistical Analysis of Subjective Parameter.(n=30)

Subject Parameter	Groups		Mean	Median	SD	SE	Wilcoxon W	P-Value	% Effect	Result
Avipaka	Group A	BT	1.80	2.00	0.41	0.11	-3.317b	0.0009	40.74	Sig
		AT	1.07	1.00	0.46	0.12				
	Group B	BT	1.53	2.00	0.52	0.13	-2.000b	0.0455	17.39	Sig
		AT	1.27	1.00	0.46	0.12				
Daurbalya	Group A	BT	1.47	2.00	0.92	0.24	-3.000b	0.0027	40.91	Sig
		AT	0.87	1.00	0.74	0.19				
	Group B	BT	0.93	1.00	0.70	0.18	-2.236b	0.0253	35.71	Sig
		AT	0.60	1.00	0.51	0.13				
Angamarda	Group A	BT	1.07	1.00	0.96	0.25	-2.236b	0.0253	31.25	Sig
		AT	0.73	1.00	0.70	0.18				
	Group B	BT	0.87	1.00	0.74	0.19	-2.236b	0.0253	38.46	Sig
		AT	0.53	1.00	0.52	0.13				
Karshya	Group A	BT	1.13	1.00	0.92	0.24	-2.236b	0.0253	29.41	Sig
		AT	0.80	1.00	0.68	0.17				
	Group B	BT	0.67	1.00	0.62	0.16	-1.732b	0.0833	30.00	Sig
		AT	0.47	0.00	0.52	0.13				
Jwara	Group A	BT	0.27	0.00	0.46	0.12	-2.000b	0.0455	100.00	Sig
		AT	0.00	0.00	0.00	0.00				
	Group B	BT	0.20	0.00	0.41	0.11	-1.732b	0.0833	100.00	NS
		AT	0.00	0.00	0.00	0.00				
Swasha	Group A	BT	0.20	0.00	0.56	0.14	-1.000b	0.3173	33.33	NS
		AT	0.13	0.00	0.35	0.09				
	Group B	BT	0.07	0.00	0.26	0.07	.000c	1.0000	0.00	NS
		AT	0.07	0.00	0.26	0.07				
Pipasa	Group A	BT	0.60	0.00	0.74	0.19	-2.000b	0.0455	44.44	Sig
		AT	0.33	0.00	0.49	0.13				
	Group B	BT	0.27	0.00	0.46	0.12	-1.000b	0.3173	25.00	NS
		AT	0.20	0.00	0.41	0.11				
Aruchi	Group A	BT	0.93	1.00	0.80	0.21	-2.333b	0.0196	50.00	Sig
		AT	0.47	0.00	0.64	0.17				
	Group B	BT	0.40	0.00	0.63	0.16	-1.732b	0.0833	50.00	NS
		AT	0.20	0.00	0.41	0.11				
Varchamutragraha	Group A	BT	1.07	1.00	0.96	0.25	-2.530b	0.0114	50.00	Sig
		AT	0.53	1.00	0.52	0.13				
	Group B	BT	0.67	1.00	0.82	0.21	-1.732b	0.0833	30.00	NS
		AT	0.47	0.00	0.64	0.17				
Hepatomegaly	Group A	BT	0.40	0.00	0.51	0.13	-2.000b	0.0455	66.67	Sig
		AT	0.13	0.00	0.35	0.09				
	Group B	BT	0.40	0.00	0.51	0.13	-1.414b	0.1573	33.33	NS
		AT	0.27	0.00	0.46	0.12				
Splenomegaly	Group A	BT	1.80		2.00	0.77 0.20	-3.542b	0.0004	74.07	Sig
		AT	0.47		0.00	0.52 0.13				
	Group B	BT	1.53		2.00	0.52 0.13	-3.464b	0.0005	52.17	Sig
		AT	0.73		1.00	0.46 0.12				

Table No-07: Showing the Statistical Analysis of Objective Parameter.(n=30)

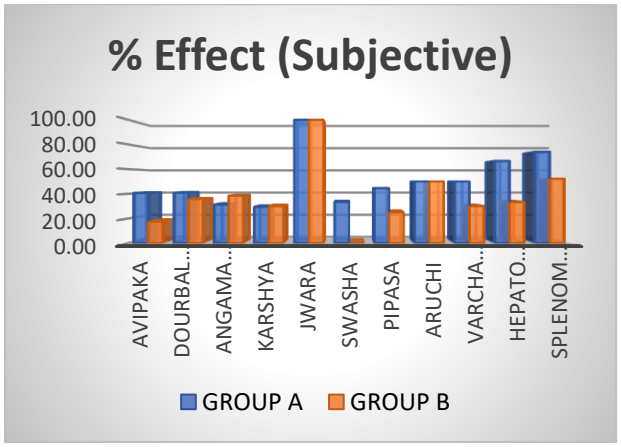
Objective Parameter			**Mean**	**SD**	**SE**	**t-Value**	**P-Value**	**% Change**	**Result**
TLC	Group A	BT	1.27	0.80	0.21	4.036	0.001	57.89	Sig
		AT	0.53	0.64	0.17				
	Group B	BT	0.93	0.70	0.18	3.055	0.009	42.86	Sig
		AT	0.53	0.52	0.13				
ESR	Group A	BT	2.80	1.52	0.39	-2.256	0.041	19.05	Sig
		AT	3.33	1.59	0.41				
	Group B	BT	3.53	1.68	0.43	-2.646	0.019	9.43	Sig
		AT	3.87	1.85	0.48				
Hb%	Group A	BT	1.13	0.99	0.26	3.055	0.009	35.29	Sig
		AT	0.73	0.70	0.18				
	Group B	BT	1.13	0.52	0.13	1.871	0.082	17.65	NS
		AT	0.93	0.70	0.18				
Reticulocyte Count	Group A	BT	0.73	0.59	0.15	1.000	0.334	18.18	NS
		AT	0.60	0.63	0.16				
	Group B	BT	0.80	0.56	0.14	1.871	0.082	25.00	NS
		AT	0.60	0.51	0.13				

(SD=Standard Deviation, SE=Standard Error, t=Test of Significance, P=Probability, <0.05=Significant at 5% level, >0.05 = No Significant at 5% level)

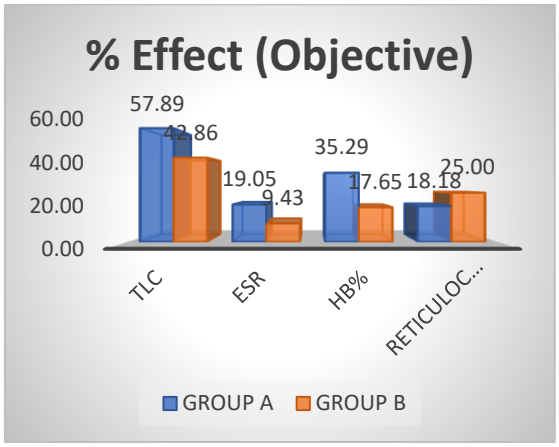
Table No.08: Showing clinical assessment of Result in Group-A and Group-B

Overall Effect	**Group A**		**Group B**	
	No of cases	**Percentage(%)**	**No of cases)**	**Percentage(%)**
Marked Improvement	0	0.00%	0	0.00%
Moderate Improvement	6	40.00%	0	0.00%
Mild Improvement	8	53.33%	11	73.33%
No Change	1	6.67%	4	26.67%
TOTAL	**15**	**100.00%**	**15**	**100.00%**

GRAPH 1



GRAPH 2



GRAPH 3