IAMJ

Research Article International Ayurvedic Medical Journal ISSN:2320 5091

EFFECTIVENESS OF *VAMANA* (THERAPEUTIC EMESIS) AND *ASTANAGALA-VANA* (AYURVEDIC HERBO MINERAL COMPOUND) ON ALCOHOL WITH-DRAWAL SYNDROME

Suhas Kumar Shetty[1], Savitha H P[2], Narayana Prakash B[3]

[1]Ph.D. Scholar & Associate Prof, [2]Associate Prof, [3]Prof & HOD

Dept of Manasa Roga, SDM College of Ayurveda & Hospital, Hassan, Karnataka, India

ABSTRACT

Background – Alcohol withdrawal is a state where in after the sudden stoppage of alcohol, symptoms like nausea, vomiting, increased hand tremors, anxiety, sweating, tachycardia, low grade fever, auditory, visual and tactile disturbances, agitation, headache are seen. *Madatyaya* in Ayurveda refers to various disorders which are resultant of improper & excessive usage of alcohol. *Kaphasthanaanupoorva Chikitsa* (Treating the seat of *Kapha*) is indicated in *Madatyaya*. Hence in this study *Vamana* was selected to eligible patients of *Madatyaya* (Alcohol withdrawal syndrome) followed by administration of *AstangaLavana* (Ayurvedic Herbo mineral formulation) in the dose of 6 gms twice a day for 1 month. **Materials & methods** – Diagnosed patients of *Madatyaya* were randomly selected into two groups. Group A received *Vamana* & *AstangaLavana* & Group B received *Vamana* & placebo powder for 1 month. Ayurvedic parameters of *Madatyaya* & Clinical institute scale for Alcohol withdrawal (CIWA Scale) was used to assess the clinical improvement. **Observation & results** – Clinical data was collected & analyzed using statistical tests like Wilcoxon test & Mann Whitney tests for subjective symptoms (Ordinal data) and paired & unpaired t test for objective symptoms (numerical data). 103 patients of *Madatyaya* were registered for this clinical study. Mean age of first drink of alcohol was between 15 – 25 yrs. The total duration of drinking alcohol was 19 $\pm$ 6.81 years in Group A and in group B 20.1 $\pm$ 10.57 years. Clinical improvement was seen in both groups on subjective & objective parameters, which were statistically significant. **Conclusion**–Both groups provided significant improvement in subjective but there was significant improvement in objective symptoms after *Vamana* & *Astanga Lavana*. Thus by seeing the effect it can be concluded that *Madatyaya* can be better treated with *AstangaLavana* as *Shamanoushadhi* after *Vamana* in eligible patients.

Keywords: *Madatyaya*, Alcoholism, Alcohol withdrawal syndrome,

INTRODUCTION

Alcohol withdrawal syndrome has multiple causes, with genetic, physiological, psychological and social factors all playing a role. The drug abuse surveys have shown the prevalence of alcoholism as 5 to 20 percent. In India, general population surveys show the prevalence rate as high as 16 to 50 percent[1]. *Madatyaya* in Ayurveda refers to various disorders which arise from improper & excessive consumption of *Madya* (Alcohol). *Madya* impairs all *Dhatu* (Tissues) & *Ojus* (Essence of *Dhatu*) [2]. The principle is

to treat the *KaphaSthana* first (Seat of *Kapha*). Hence *Vamana* is the main *Shodhana* treatment for *Madatyaya*[3, 4]. Various formulations like *Astanga Lavana*are described for disorders of alcohol[5].

AIMS AND OBJECTIVES OF THE STUDY

- To evaluate the efficacy of *Vamana*followed by *AstangaLavana*in *Madatyaya*.
- To compare the efficacy of *Vamana* followed by Placebo in *Madatyaya*.
- To compare the effect of two groups.

MATERIALS AND METHODS

Diagnostic criteria:

Diagnosis was made on the basis of general signs & symptoms of *Madatyaya*[6-12] and DSM – IV – TR criteria[7, 13].

Inclusion criteria:

1. Diagnosed Patients of *Madatyaya* (alcohol withdrawal symptoms) [6, 7].
2. Ageing between 16 – 70 years of either sex.

Exclusive criteria:

1. The patient suffering from any organic brain disorders.
2. Patients suffering from complications of alcohol related disorders like esophageal varices, Cirrhosis of liver etc.
3. Patients unfit for *Vamana*

Source of data: 103 patients of *Madatyaya* were selected from SDM college of Ayurveda & Hospital, Hassan.

Methods of collection of data: 103 diagnosed patients of *Madatyaya* who fulfill the inclusion criteria were selected for the study and were randomly assigned into 2 groups. Duration of the treatment was 1 month. Patients were followed up for 1 month. Assessment was done before and after the study period.

Group A: Study Group (*Vamana* & *AstangaLavana*)

- *DeepanaPachana – Musta choorna*-4 gmstid before food with hot water – 3 days or till attainment of *Niramalaxana*
- *ArohanaSnehapana-MoorchitaGhrita* till attainment of *SamyakSnigdhaLaxana*
- *SarvangaAbhyanga* with *MoorchitaTaila + Bashpasweda* – 1 day plus *Kaphautkleshakara ahara*
- *Vamana - Madanaphala Yoga (Madanaphala + Yasti + Vacha + Saindhava + Madhu)* after*AkantaKsheerapana*
- *TarpanadiSamsarjana – LajaManda, Ksheeranna, Odana*
- *AstangaLavana* - 6 gms, bd half an hour before food with water – 1 month

Group B: Control Group (*Vamana*& Placebo powder)

- *DeepanaPachana, Snehapana, Abhyanga&Vamana* was done similar to study group
- Later, Placebo Powder (Ragi + Sugar + *Saindhava*) - 6 gms, bd half an hour before food with water was given for 1 month

Assessment criteria: Assessment of clinical study was done based on the subjective and objective parameters. Standardized scoring of symptoms of *Madatyaya* was used[6]. Revised Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) scale was used[14]

Observation & results

103 patients of *Madatyaya* were registered for this clinical study. They were treated in two groups as *AstangaLavana* Group and Placebo Group.*Vamana* was carried in both groups before administering *AstangaLavana* & Placebo powder.

A proforma was designed to collect and record the information verbally reported by the subjects. The signs and symptoms of *Madatyaya* described in authoritative Ayurvedic texts and DSM IV diagnostic criteria for alcohol withdrawal were used as the tools for assessment of the variables.

The demographic data are as follows:

In this study maximum number of patients was belonging to 30 – 40 years age group as shown in table 1. Out of 103 subjects, 98% were male and 2% were female. Out of 103 subjects, 29% were Businessmen, 22% were Employees (Office workers), 16% were drivers, 10 % were Coolie and 8 % were Farmers. 81% subjects were married where as 19% subjects were unmarried. Mean age of first drink of alcohol was between 15 – 25 yrs as shown in table 2. The total duration of drinking alcohol in group A was 19 $\pm$ 6.81 years and in group B was 20.1 $\pm$ 10.57 years. The causes for initial drinking in 103 subjects was due to Curiosity 23.33% of subjects, due to Peer group pressure 16.67% subjects, due to Family problems 3.33% subjects, due to Depressive mood 3.33% subjects, due to Loneliness 3.33% subjects and due to Curiosity and Peer group pressure 50% subjects. It was observed in the study that the duration of first withdrawal symptoms experienced among the two groups in 3.6$\pm$3.67 years. Out of 103 patients 88 % presented with *Aruchi*, 10 % had *Chardi*, 92 % had *Prajagara*, while 17 % patients had *Bhrama*, 20 % had *Hrillasa*, 8 % had *Pralapa*, 71 % had *ShareeraKampa* and 2% were having *RoopanamAsatam-ChaivaDarshanam* (Table – 3). Clinical presentation as per CIWA scale is described in table 4.

Important Observations duringPoorvakarma (Prior to Vamana Karma) in both groups:

- Average *DeepanaPachana*with *Musta-Choorna* days– 2 days
- Average number of days taken for *Arohana*Snehapana – 4 days
- Maximum, (43.34%) of the patients had *SamyakSnigdhaLakshana* (features of proper internal oleation) on the fourth day of *Snehapana*.
- Average total dose of *ghee* was 315 ml.
- *Kaphautkleshkara Ahara* was given on day before *Vamana*.

Observation during Vamana

- The average quantity taken for *Aakanthapana* (stomach filled up to the throat) was 996 ml,
- While time taken for the *Aakanthapana* was 9.5 minutes.
- Average time taken for induction of the first *Vega* was 12 minutes, while after administering *Vamana yoga*, self-induced and projectile *Vega* was observed in 50% of the patients.
- The average number of *Vega* was 5.46.
- Average number of *Upavega* (smaller bouts) was 7.
- The difference in average quantity of output and input was 0.48 lt
- *Pittanta* appeared in 30.76% of the patients, *Katu-Tiktaasyata* (spicy and bitter taste in mouth) was observed in 53.84% of the patients
- *GalakanthaDaha* (burning sensation in throat) 64.28% of the patients.
- In *SamyakaVamitaLakshana* (signs and symptoms of proper emesis) *Kale Pravruti* (timely expulsion) was observed in 69.23% of the patients

- *YathakramaDoshadarshana* (expulsion of *Dosha* in order) was seen in 78.51% of the patients.
- *MadhyamaShuddhi* was observed in 53.84% of the patients.
- Dominant *Antiki* observed – *Pittanta* (84%)
- Average number of *Vamana Vega* - 6
- *LaingikiLakshana- Samyak*
- *Maniki*– Output more

Complications observed during *Vamana*-

- *RaktachandrikaDarshana* – 3 patients
- *Bhrama* – 7 patients
- Headache – 8 patients
- Pain Abdomen – 6 patients

Above conditions were managed accordingly.

Observations on *Paschat karma*

- *MadhyamaShuddhi* was observed
- *TarpanadiSamsarjana* was adviced for 3 days
- *AstangaLavana*& Placebo powder started after *Samsarjanakrama* for 1 month

Results: Following results on subjective symptoms (Table 5 & 8) were observed in 2 groups as described below**:**

1. Effect on *Aruchi:* Trial Group A Showed 66.67 % improvement in *Aruchi* which is statistically significant on the other hand Group B showed improvement of 22.22% which is statistically insignificant. Intergroup comparison shows statistically significant result (p value is 0.0257) which states that there is significant difference between efficacy of Trial drug and Control placebo groups.

2. Effect on *Chardi:* Trial Group A Showed 60% improvement in *Chardi* which is statistically highly significant on the other hand Group B showed improvement of 10% which is statistically insignificant. Intergroup comparison shows statistically highly significant result (p value is 0.0014)

3. Effect on *Prajagara:* Trial Group A Showed 54.54% improvement in *Prajagara* which is statistically significant on the other hand Group B showed improvement of 16.67% which is statistically insignificant. Inter group comparison shows statistically insignificant result (p value is 0.0616).

4. Effect on *ShariraKampa:* Trial Group A Showed 62.5% improvement in *Sharira-Kampa* which is statistically highly significant on the other hand Group B showed improvement of 19.23% which is statistically significant.

5. Effect on *Bhrama:* Trial Group A Showed 40% improvement in *Bhrama* which is statistically insignificant on the other hand Group B showed improvement of 42.86% which is statistically insignificant. Intergroup comparison shows statistically insignificant result (p value is 0.348)

6. Effect on *Hrillasa:* Trial Group A Showed 60% improvement in *Hrillasa* which is statistically highly significant on the other hand Group B showed improvement of 10% which is statistically insignificant. Inter group comparison shows statistically highly significant result (p value is 0.0014)

7. Effect on *Pralapa:* Trial Group A Showed 54.54% improvement in *Pralapa*which is statistically significant on the other hand Group B showed improvement of 16.67% which is statistically insignificant. Inter group comparison showed statistically insignificant result (p value is 0.0616) which states that there is no significant difference between efficacy of Trial drug and Control placebo groups.

Effect on Haemotological & liver function test: In the present clinical study it was observed that when objective symptoms were compared between 2 groups (*Vamana & Astanga Lavana* and *Vamana* & Placebo group) there was statistical significant difference in Haemoglobin percentage ($t = 5.66$, $p < 0.001$), Total bilirubin ($t = 5.14$, $p < 0.001$), direct bilirubin ($t = 5.79$, $p < 0.01$), SGOT ($t = 2.70$, $p < 0.01$) , SGPT ($t = 3.20$, $p < 0.01$), Total protein ($t = 3.83$, $p < 0.01$), albumin ($t = 3.40$, $p < 0.011$), where as there was not statistical significant difference in alkaline phosphate ($t = 2.10$, $p < 0.10$) among 2 groups as shown in table 6, 7 & 9.

DISCUSSION

For the person suffering from *Madatyaya* due to heavy and prolonged consumption of alcohol, the first aim of the treatment should be safer resolution of withdrawal state. That is why in this study alcohol withdrawal state was selected. The therapy and drug selected are *Vamana* and *Astanga Lavana*, as this combination fulfills the needed qualities to treat withdrawal state.

Socio-Demographic Data: In this study maximum number (48 %) of patients were belonging to 30 – 40 years age group. The reason for this can be the fact that a person will be suffering from alcohol withdrawal symptoms only after heavy and prolonged usage of alcohol. The Mean age at first drink of alcohol was between 15 – 25 years. Adolescent age is prone for peer pressure and experiencing new things like alcohol & other substance abuse.

Subjective symptoms: There was no much difference in subjective criteria in both groups. The *Deepana* and *PachanaAushadhi (MustaChoorna)* were given before the *Snehapana* which improves the *Agni* and also after *Vamana* the *SamsarjanaKrama* improves the state of *Agni* because of which *Aruchi*subsides, but in Placebo group even after the treatment 5.6 % of patients had not releaved by *Aruchi*. *AstangaLavana* possess the *DeepanaPachanaAushadhi* which also improves the *Agni*. The *Pralapa* is the symptom seen in the second stage of *Mada* and after the withdrawal gradually the symptom reduces and after *Vamana* as channels become free from *Dosha* the patient's perception becomes normal[15]. *ShareeraKampa* is due to chronic addiction as the tissues are not able to function without alcohol. The sudden cessation of alcohol may increase the *ShareeraKampa* but due to *Snehana* the vitiated *Vata* gets subsided and *Shodhana* channelizes the *Dosha* hence *ShareeraKampa* reduces completely after *Shodhana.*

Effect on Haematological&Liver Function Test: *AstangaLavana* contains *Deepana*, *Pachana* and *Srotoshodhan* drugs which improves the function of liver hence the significant improvement was seen in all the parameter of Liver Function test in ALG but the results obtained in Placebo group may be due to the effect of *Shodhana*only.

CONCLUSION

The combination of trial therapy & drug, *Vamana* and *AstangaLavana* significantly reduces the signs & symptoms of alcohol withdrawal state excluding withdrawal seizures and delirium tremens. Thus the null hypotheses have been rejected at $P<0.001$. *Vamana* & *AstangaLavana* provided significant improvement in most of subjective symptomsIt significantly increased Haemoglobin (2.1 %), Total protein (2.25 %) and Albumin (3.12 %). It significantly decreased total Bilirubin (42.72%), Direcct bilirubin (40.47 %), SGOT (67.65 %), SGPT (58.52

%) and Alkaline Phosphate (33.36%). *Vamana* and Placebo Groupalsoshowed improvement in all subjective symptoms with improvement in total Bilirubin(9.70%), Direct bilirubin (21.77 %), SGOT (22.55 %), SGPT (18.11 %), Total protein (1.63%), Albumin (0.45 %), Alkaline Phosphate (8.58%).

REFERENCES

1. Kaplan & Sadock: Comprehensive textbook of psychiatry,Lippincott Williams & Wilkins publication, 8th edition, 2005,11.2 Alcohol - Related Disorders, page no - 1168.
2. Ravi K. V., ChiplunkarShivprasad, ShettySuhas Kumar, Study on Effect of *Madya* on *Ojas*, International Ayurvedic Medical Journal: Volume 1; Issue 4; July – Aug 2013
3. Agnivesha: CharakaSamhita of Agnivesha, revised by Charaka and Dridhabala with the Ayurveda - Dipika commentary ofChakrapanidatta, edited by VaidyaJadavjiTrikamjiAcharya, MunshiramManoharlal Publishers pvt.Ltd. 5th edition 1992,ChikitsaSthana, 24/59.
4. Shetty SK, Savitha HP, NarayanaPrakash B. Critical Review on Role of *Panchakarma* in *Madatyaya* (Alcoholic Disorders). Journal of Ayurveda and Holistic Medicine. 2013;1(1):12-16.
5. ShettySuhas K, Bhat N P, Savitha H P, Sunil Kumar K N, Ravishankar B (2013), Standardization Of *AstangaLavana*- A Herbo-Mineral Ayurvedic Compound, *Global J Res. Med. Plants &Indigen. Med.*, Volume 2(8): 589–598
6. Shetal l. Sadalagi, NarayanaPrakash B, Suhas Kumar Shetty , Effect of *Vamana* and *AshtangaLavana* in the management of *Madatyaya*, AYU-Vol. 30, no. 4 (October-December) 2009, pp. 463-468
7. Kaplan &Sadock : Comprehensive textbook of psychiatry,Lippincott Williams & Wilkins publication, 8th edition, 2005,11.2 Alcohol - Related Disorders, page no - 1176
8. Agnivesha: CharakaSamhita of Agnivesha, revised by Charaka and Dridhabala with the Ayurveda - Dipika commentary ofChakrapanidatta, edited by VaidyaJadavjiTrikamjiAcharya, MunshiramManoharlal Publishers pvt.Ltd. 5th edition 1992,ChikitsaSthana- 24/107.
9. Sushruta :SushrutaSamhita with NibandaSangrahaCommentryof Sri Dalhanacharya, edited by VaidyaJadavjiTrikamjiAcharya. ChaukhambhaOrientalia Varanasi, 7th edition 2002,Uttaratantra, 47/17.
10. Agnivesha: CharakaSamhita of Agnivesha, revised by Charaka and Dridhabala with the Ayurveda - Dipika commentary of Chakrapanidatta, edited by VaidyaJadavjiTrikamjiAcharya, MunshiramManoharlal Publishers pvt.Ltd. 5th edition 1992, ChikitsaSthana- 24/108.
11. Agnivesha: CharakaSamhita of Agnivesha, revised by Charaka and Dridhabala with the Ayurveda - Dipika commentary ofChakrapanidatta, edited by VaidyaJadavjiTrikamjiAcharya, MunshiramManoharlal Publishers pvt.Ltd. 5th edition 1992, ChikitsaSthana24/177.
12. Agnivesha: CharakaSamhita of Agnivesha, revised by Charaka and Dridhabala with the Ayurveda - Dipika commentary ofChakrapanidatta, edited by VaidyaJadavjiTrikamjiAcharya, MunshiramManoharlal Publishers pvt.Ltd. 5th edition 1992, ChikitsaSthana24/178.

13. Revised Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar) scale. Wetterling*et al*. (1997) have derived the Alcohol Withdrawal Scale (AWS)
14. Kaplan & Sadock : Comprehensive textbook of psychiatry, Lippincott Williams & Wilkins publication, 8th edition, 2005,11.2 Alcohol - Related Disorders, page no - 1177.
15. Yadaiah P, Pharmacokinetics of *Vamana;* Journal of pharmaceutical & scientific innovation, Vol 1(4), Jul Aug 2012; pp 19-20

Annexure: Table 1: Showing incidence of Age

Age**(in Years)**	Total	
	No. of pt	**Percentage**
20 - 30	24	23.00
30 - 40	49	48.00
40 - 50	17	16.00
50 - 60	11	11.00
60 - 70	2	2.00

Table 2: Showing incidence of Age of starting of Alcohol

Age of starting Alcoholin years	Total	
	No. of pt	**Percentage**
10 - 15	5	5.00
15 - 20	39	39.00
20 - 25	24	23.00
25 - 30	15	15.00
30 - 35	7	6.00
35 - 40	13	12.00

Table 3: Showing incidence of signs and symptoms

Signs and symptoms	**Total**	
	No. of pt	%
Aruchi(Loss of apetite)	88	88.00
Chardi(Vomiting)	10	10.00
Prajagara(Insomnia)	93	92.00
Atisara(Loose stools)	0	0.00
Bhrama(Giddiness)	17	17.00
Hrillasa(Nausea)	20	20.00
Pralapa(Delirium)	8	8.00
ShareeraKampa(Tremors)	70	71.00
RoopanamAsatamChaivaDarshanam(Hallucination)	2	2.00

Table 4: Showing CIWA assessment

Signs and symptoms	**Total**

	No. of pt	%
Nausea/Vomiting	92	92.00
Tremors	70	70.00
Anxiety	33	32.00
Agitation	8	8.00
Sweating	6	6.00
Orientation	3	3.00
Tactile disturbance	0	0.00
Auditory disturbance	0	0.00
Visual disturbance	2	2.00
Headache	17	17.00

Table 5: Effect of *Vamana&AstangaLavana* on Subjective parameters: (Wilcoxon signed rank test)

Variable	Group	Mean BT	Mean AT	Mean Diff	% Re-lief	SD±	SE±	P	S
Aruchi	Gr. A	0.75	0.25	0.5	66.67	0.76	0.17	0.015	S
	Gr. B	0.45	0.35	0.10	22.22	0.31	0.06	0.500	IS
Chardi	Gr. A	1.00	0.40	0.60	60	0.58	0.12	0.0005	HS
	Gr. B	1.00	0.90	0.10	10	0.31	0.06	0.500	IS
Prajagara	Gr. A	0.55	0.25	0.30	54.54	0.47	0.11	0.031	S
	Gr. B	0.60	0.50	0.10	16.67	0.31	0.06	0.500	IS
Shareera Kampa	Gr. A	1.2	0.45	0.75	62.50	0.55	0.12	0.0001	HS
	Gr. B	1.3	1.05	0.25	19.23	0.44	0.09	0.0625	IS
Bhrama	Gr. A	0.50	0.30	0.20	40	0.41	0.9	0.125	IS
	Gr. B	0.35	0.20	0.15	42.86	0.36	0.08	0.250	IS
Hrillasa	Gr. A	1.00	0.40	0.60	60	0.58	0.12	0.0005	HS
	Gr. B	1.00	0.90	0.10	10	0.31	0.06	0.500	IS
Pralapa	Gr. A	0.55	0.25	0.30	54.54	0.47	0.11	0.031	S
	Gr. B	0.60	0.50	0.10	16.67	0.31	0.06	0.500	IS

Note: S= Significant IS=Insignificant HS= Highly significant

Table 6: Effect of *Vamana&AstangaLavana* on objective parameter

	Mean score		**% of re-duction in mean score**	**S.D(±)**	**S.E(±)**	**t' Value**	**p' Value**
	BT	AT					
Hb %	12.4	12.66	**2.10**	0.22	0.05	5.66	<0.001
TC	8180.55	8351.38	**2.08**	266.82	62.89	5.98	<0.001

Total Bilirubin	1.47	0.84	**42.72**	0.51	0.12	5.14	<0.001
Direct Bilirubin	0.7	0.41	**40.47**	0.22	0.05	5.79	<0.01
SGOT	98.13	31.74	**67.65**	104.13	24.54	2.70	<0.01
SGPT	68.07	28.23	**58.52**	52.80	12.44	3.20	<0.01
Total Protein	7.15	6.98	**2.25**	0.41	0.09	3.83	<0.01
Albumin	3.90	3.78	**3.12**	0.38	0.09	3.40	<0.01
Alkaline Phos-phate	127.51	84.96	**33.36**	85.65	20.18	2.10	<0.10

Table 7: Effect of *Vamana*& Placebo on objective parameter

	Mean score		**% of reduction in mean score**	**S.D(±)**	**S.E(±)**	**'t' Value**	**' p' Value**
	BT	AT					
Hb %	12.98	12.81	**1.31**	0.51	0.12	3.65	<0.01
TC	9261.76	9262.05	**0.003**	337.62	1.88	5.67	<0.001
Total Bilirubin	1.39	1.25	**9.70**	0.138	0.03	5.44	<0.001
Direct Bilirubin	0.72	0.57	**21.77**	0.21	0.05	3.80	<0.01
SGOT	73.3	56.77	**22.55**	50.46	2.23	1.58	> 0.05
SGPT	55.04	45.07	**18.11**	24.72	0.99	1.94	>0.05
Total Protein	7.54	7.42	**1.63**	0.28	0.06	4.51	<0.001
Albumin	3.91	3.9	**0.45**	0.27	0.06	3.06	<0.01
Alkaline Phosphate	94.72	86.59	**8.58**	21.51	0.21	2.75	<0.02

Table 8: Intergroup Symptoms comparison in Group A& Group B (Mann-Whitney Test):

Variable	Group	Mean Rank	Sum of Ranks	Z-value	2-tailed value	Interpretation
Aruchi	Gr. A	44.78	71.9	-3.082	0.002	S
	Gr. B	37.32	53.0			
Chardi	Gr. A	49.33	73.2	-1.593	0.111	NS
	Gr. B	34.05	43.0			
Prajagara	Gr. A	43.83	53.8	-0.913	0.361	NS
	Gr. B	0.100	0.308			
ShareeraKampa	Gr. A	44.78	71.9	-3.082	0.002	S
	Gr. B	37.32	53.0			
Bhrama	Gr. A	49.33	73.2	-1.593	0.111	NS
	Gr. B	0.150	0.366			
Hrillasa	Gr. A	49.33	73.2		0.111	NS

	Gr. B	34.05	43.0	-1.593		
Pralapa	Gr. A	43.83	53.8		0.361	NS
	Gr. B	37.32	53.0	-0.913		

Note: S= Significant IS=Insignificant HS= highly significant

Table 9: Showing difference in objective criteria among 2 groups after applying unpaired t test

Haematology	ALG	PG	S.D(±)	S.E(±)	't' Value	'p' Value
Hb %	2.10	1.31	0.22	0.05	5.66	<0.001
Total Count	2.08	0.003	266.82	62.89	5.98	<0.001
Total Bilirubin	42.72	9.70	0.51	0.12	5.14	<0.001
Direct Bilirubin	40.47	21.77	0.22	0.05	5.79	<0.01
SGOT	67.65	22.55	104.13	24.54	2.70	<0.01
SGPT	58.52	18.11	52.80	12.44	3.20	<0.01
Total Protein	2.25	1.63	0.41	0.09	3.83	<0.01
Albumin	3.12	0.45	0.38	0.09	3.40	<0.01
Alkaline Phosphate	33.36	8.58	85.65	20.18	2.10	<0.10

CORRESPONDING AUTHOR

Dr Suhas Kumar Shetty
Ph.D. Scholar & Associate Prof
Dept of Manasa Roga,
SDM College of Ayurveda & Hospital,
Hassan, Karnataka, India
Email: drsuhasshetty@gmail.com

Source of support: Nil
Conflict of interest: None Declared