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A Comparative Clinical Evaluation of *Saktu Kalpanas* in *Grishma Ritu* w.s. r to *Klamahara*

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ABSTRACT

Back ground: In *Grishma Ritu environment* is prevalent with intense heat and dry wind, strength of the individuals become less and develop *Klama* (fatigue) as main feature of climatic toll on human body. *Ritucharya* is an untapped tool of *Ayurveda* developed to counter seasonal variations on human body and may be a Pandora box in addressing the global problems caused by climatic change. **Objective:** To study the effect of *Yava Saktu* and *Yava-Chanaka Saktu* in *Grishma Ritu* as *Klamahara.***Methods:***60 healthy volunteers fulfilling the inclusion criteria in the age group of 17-35 years, of either sex were selected for the study and were randomly divided into three groups (Group A-*Yava Saktu*, GroupB-*Yava-Chanaka Saktu* and Group C-non interventional)of each 20 healthy individuals. Group A was advised to take *Yava Saktu,* Group B-*Yava-Chanaka Saktu* once daily in the morning for a period of 15 days in particular on the onset of Summer Season (in this study 5th April 2018 onwards based on *Grishma Kala Swarupa*) and Group C used as control for the study. **Results:** A highly significant (p<0.001) improvement in almost all parameters; *Arogya Lakshana,* and *Klama* assessment parameters were seen. **Conclusion:** *Yava-Chanaka Saktu* is more palatable than *Yava Saktu. Yava Saktu* is potential ESR reducer along with a mild increase in Hb% was noted.

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INTRODUCTION

Ritucharya holds great significance in *Ayurveda.* A good seasonal routine helps in achieving balance of *Dosha*[1]. Following the seasonal routine is intended to nullify the influence of changing climatic conditions on the body. It play a role in reducing stress of the season, which are bound to undergo variation by the influence of climatic change. It also helps in prevention of diseases. Seasonal routine can be better understood as a process of acclimatization to the changing nature of climate in the processes from one *Ritu* to other *Ritu.*

Indian subcontinent is in tropical belt of earth, having most exposed to sun in the months of April to June and recognized as Summer climate. In *Grishma Ritu* environment is prevalent with intense heat and unhealthy wind[2], strength of the person become less[3] and develops *Klama*[4] as main feature of climatic effect on human body. *Ayurveda* in particular to *Ritu Charya* has untapped potential in addressing this global problem. *Ritu Charya* may be a cost effective solution for all the seasonal based problems. In fact in the *Grishma Ritu Charya*, many inexpensive measures are stated to counter the effect of seasonal impact on the body. To prevent *Grishma Rituja Klama*, *Saktu Prayoga* after *Snana* is advised[5]. Flour of roasted Grains is an excellent preventive measure for *Klama* of *Grishma Ritu*. *Yava Saktu* is *Sheetala, Dipana, Balakara, Vrushya, and Brimhana*[6]. *Chanaka Saktu* is *Trisnahara, Sramahara, Klamahara* and good for *Grishma Ritu*[7].

The present study is a step forward in the direction to establish and compare the role of these two *Saktu Kalpana* mentioned by *Acharya Vagbhata* and *Bhava Mishra* for *Grishma Ritu* as *Klama Hara Yoga.*

AIMS AND OBJECTIVE

To study the effect of *'Yava Saktu'* and *'Yava-ChanakaSaktu'* in *Grishma Ritu* as *Klamahara.*

MATERIALS AND METHODS

Source of data

60 apparently healthy individuals fulfilling inclusion criteria were selected into 3 groups i.e. 2 interventional and 1 control group for the study irrespective of sex, caste and socio economic status from Sri Dhramasthala Manjunatheshwara college of *Ayurveda,* Udupi.

Method of collection of data

A special Performa was prepared with *Lakshanas* of *Arogya, Klama, which* are mentioned in classics.

Study design

Study type: Comparative

Allocation: Randomized

Masking: Open label

Interventional model: Parallel.

Primary purpose: Treatment

Endpoint classification: Efficacy study

Design : Pre-test, Post-test, and Follow up design.

Intervention

The included subjects were randomly divided under Group A, B, and C. The improvements were assessed by assessment criteria.

Group A: Yava Saktu

Number of volunteers: 20

Dosage: 150ml

Anupana: Cold water

Route: Oral

Duration: 15days

Follow up: 15 days

Group B: Yava-Chanaka Saktu

Number of volunteers: 20

Dosage: 160ml

Anupana: Cold water

Route: oral

Duration: 15days

Follow up: 15 days

Group C: It is a non- interventional control group used as a control for the study.

Duration of study: 15days

Follow up: 15 days

Period of study: April to May 2018

Criteria for selection of patient

Inclusion criteria:

• Apparently healthy volunteers who are interested and willing to take *Saktu Kalpanas*

• Age group between 17 to 35 years irrespective to gender, religion, socio-economic status.

Exclusion criteria

• Subjects suffering from any acute or chronic illness and systemic diseases.

Assessment criteria

Assessments were done before treatment, after treatment and after follow up on the basis of subjective parameters and objective parameters were assessed before and after treatment.

Objective parameters

Hematological-

• Hb%

• ESR

Subjective parameters

Outline:

➢ Closed-ended format has been followed.

➢ It is developed based on Likert 5 point scale.

Scoring pattern:

Strongly disagree /Not at all = 1

Disagree /A little bit = 2

Neutral /Unexplainable = 3

Agree / More = 4

Strongly agree / Too much = 5

Assessment of *Arogya* or *Swastha lakshana*

1.*Annabhilasha* (desire for food)

2.*Shareerasya laghavam* (lightness of body)

3.*Sukhaswapnaprabodanam* (comfortable sleep and awakening)

4.*Soumanasya* (calmness or happiness)

5.*Kshut saha* (Tolerance to hunger)

6.*Pipasa saha* (Tolerance to thirst)

7.*Atapa saha* (Tolerance to heat of sun)

8.*Sheeta saha* (Tolerance to cold)

9.*Vyayama saha* (Tolerance to exercise)

10. *Kankshapana* (Desire for drink)

Klama assessment

1.*Anaayasa Srama* (Tiredness without work)

2.*Svasavarjita* (Absence of forced breathing)

3.*Kramashah Bala Hrasa* (Gradual loss of strength)

Statistical methods:

Statistical analysis was carried out using Statistical Package for Social Science (SPSS) VER.20. Parametric test was used for objective parameters. Paired t test within the group and unpaired t test between the groups was done for analyzing the significance of parameters. Non-Parametric test was used for ordinal data. Friedman test within the group and Krushkal Wallis test between the group was done for analyzing the significance of parameters.

The obtained results were compared and interpreted in the statistical terms as-

Non-significant: $p > 0.05$

Significant: $p < 0.05$

Highly significant: $p < 0.001$

Method of preparation of *Saktu Kalpana*[8]

Preparation of *Saktu Kalpana* was carried out at practical hall department of *Rasa Shastra* and *Bhaishjaya Kalpana* Sri Dharmasthala Manjunatheshwara college of *Ayurveda*, Udupi.

- Dehusked *Yava* and *Chanaka* were fried in frying pan separately on *Chulhika* till appearance of characteristic *Sugandha* and till it becomes crispy in nature

and then it was made into fine flour in flour mill machine. Figure 3,4,5,6,7,8,9

Figure 3 Frying of *Yava*

Figure 4 Frying of*Chanaka*

Figure 5 Fried *Yava*

Figure 6 Fried *Chanaka*

Figure 7 Flour mill machine

Figure 8 *Yava* flour

Figure 9 *Chanaka* flour

➢ *Yava Saktu* preparation in the form of *Paneeya* by considering *Mantha* preparation[9].

• *Yava* flour was taken in the amount of 20gm, added 2ml of *Ghrita* and smash with help of fingers. Figure 10 and 11.

Figure 10 Ghrita

Figure 11 Smashing of *Yava* flour with *Ghrita*

• To the smashed mixture of *Yava* and *Ghrta,* 4(144ml) parts of water and 5 gm sugar added which was then churned. Figure 13,14,15,16

Figure 13 Smashed flour

Figure 14 Water

Figure 15 Adding flour and sugar in water

Figure 16 Churning

➢ *Yava-Chanaka Saktu* preparation in the form of *Paneeya*

(*Yava Saktu* preparation method was followed)

• *Yava-Chanaka* flour was taken in the ratio of 1:4 i.e. 4gm *Yava* and 16gm *Chanaka,* and mixed well.

• Added 1ml of *Ghrita* (considering *Sahapana Matra*) and smash with help of fingers. Figure 12

Figure 12 Smashing of *Chanaka* flour

• To the smashed mixture of *Yava - Chanaka* and *Ghrita*, 4(150ml) parts of water and 6 gm sugar added which was then churned.

Rationale behind dose fixation.

Posology:

A pilot study was carried out considering *Agni Bala* assessment questionnaire on 2 groups. Each group consists of 6volunteers 2 volunteers of each *Agni* type that is *Teeekhnagni Angi -2, MadhyamaAngi-2 and Vishama Angi-*2

Assessment of *Agni*[10]

1.   **Evaluation of *Jarana Shakti.***

Ahara Jirna Lakshana (proper digestion)

• *Utsaha* (enthusiasm)

• *Laghuta* (lightness)

• *Udgara shuddhi* (clear belching)

• *Kshudha* (hunger)

• *Trishna* (thirstiness)

• *Yathocitamalotsarga* (proper evacuation of stool etc. excreta)

For the assessment of the *Agni* types scores has been given to each of above symptoms to asses *Jarana Shakti*.

Gradation of Source for *Agni Bheda* is as follows:

1.*Tikshna agni*- 4, 5.

2.*Madhyama*- 2, 3.

3.*Vishamagni*- 1.

Agni assessment scoring system

Mark 1 to 5 accordingly.

1. Assessment of *Jarana Shakti*

LAKSHANAS	SCORE
Presence of all symptoms	5
Presence of four, five symptoms	4
Presence of three symptoms	3
Presence of two symptoms	2
Uncertainty	1

2. Assessment of *Abhyavarana Shakti* (capacity of intake)

LAKSHANAS	SCORE
Taking food in excess quantity twice/thrice a day	5
Taking food in normal quantity in four times a day	4
Taking food in normal quantity in twice/thrice a day	3
Taking food in less quantity in twice/thrice a day	2
Uncertainty	1

Saktu along with *Sarkara* and *Ghrita* in *Leha* form administered to two groups for 3 days and an approximation of *Saktu Matra* was evaluated on the basis of average quantity of *Saktu* consumed by both groups in line with *Angi Prakara* and the same *Matra* was followed for the study.

Saktu Matra is decided based on *Souhitya Pramana*.

Matra of *Sarkara* and *Ghrita* is taken based on *Sahapana.*

1st day *Matra* -

Yava-Saktu:*Yava*-15gm   *Sarkara*-3gm *Ghrita*-10ml

Yava-ChanakaSaktu: *Yava*-3gm, *Chanaka*-12 gm, *Sarkara*-3gm *Ghrita*-8ml

Observation -Volunteers are not satisfied with dose.

2nd day *Matra* -

Yava-Saktu:Yava-20gm   *Sarkara*-5gm *Ghrita*-12ml

Yava-Chanaka Saktu:Yava-4gm, *Chanaka*-16 gm, *Sarkara*-6gm *Ghrita*-10ml

Observation - voltunteers are satisfied with dose.

3rd day *Matra*-

Yava-Saktu:Yava-25gm,   *Sarkara*-8gm, *Ghrita*-15ml

Yava-ChanakaSaktu:Yava-5gm, *Chanaka*-20gm, *Sarkara*-10gm, *Ghrita*-12ml

Observation – voltunteers are satiety (over satisfied) with dose.

Average *Matra* of *Saktu* is 20gm, i.e is taken for study.

This pilot study is extended for another 3 days with a period of 1 day rest for the determination of the *Anupana* .i.e

In 1st group- Administered Saktu in Leha form for 3 days

Saktu-20gm, *Sarkara*- 5gm, *Ghrita*-12ml

Observation-Appetite, thirst was increased, and irritation in the throat

Volunteers are not satisfied with dosage form

In 2nd group-Administered *Saktu* in *Paneeya* form for 3 days

Saktu-20gm, *Sarkara*-6gm, *Ghrita*-2ml, *Jala*-144ml

Observation-Appetite increases, volunteers are satisfied with dosage form.

✓ *Paneeya* form *Saktu* taken for study. Figure 17

Figure 17 *Paneeya* form *Saktu*

Table 1 Effect of *Yava Saktu* (Group A) on Hb

Mean score		Difference in mean	Paired "t" test						Interpretation
BT	AT		% Change	S.D	S.E.M	't'	P		
11.67	11.87	0.13	2.6%	0.18979	0.04244	-3.240	0.004		S

RESULTS

❖ Results on Objective parameters

Within the group

Effect of *Yava Saktu* (Group A) on Hb

The mean score before treatment was 11.67 and after treatment was 11.87 showing a mean of 0.13. *Yava Saktu* group shows 2.6% improvement in Hb which was statistically significant at p <0.004.Table 1

Effect of *Yava-Chanaka Saktu* (Group B) on Hb

The mean score before treatment was 12.46 and after treatment was 12.58 showing a mean difference of 0.12. *Yava-Chanaka Saktu* group showed 1% improvement in Hb which was statistically significant at p <0.004. Table 2

Table2 Effect of *Yava- Chanaka Saktu* (Group A) on Hb

Mean score		Difference in mean	Paired "t" test					Interpretation
BT	AT		% Change	S.D	S.E.M	't'	p	
12.46	12.58	0.12	1%	0.17206	0.03847	-3.249	0.004	S

Effect of *Yava Saktu* (Group A) on ESR

The mean score before treatment was 30.00 and after treatment was 22.05 showing a mean difference of 7.950. *Yava- Saktu* (Group A) showed 26.5% improvement in ESR which was statistically highly significant at p <0.000. Table 3

Table 3 Effect of *Yava Saktu* (Group A) on ESR

Mean score		Difference in mean	Paired "t" test					Interpretation
BT	AT		% Change	S.D	S.E.M	't'	p	

| 30.00 | 22.05 | 7.950 | 26.5% | 7.33036 | 1.63912 | 4.850 | 0.000 | HS |

Effect of *Yava-Chanaka Saktu* (Group B)on ESR

The mean score before treatment was 26.30and after treatment was 21.05 showing a mean difference of 5.250. *Yava-Chanaka saktu* group showed19.96% improvement in ESR which was statistically highly significant at p <0.000. Table 4

Table 4 Effect of *Yava - Chanaka Saktu* (Group B) on ESR

Mean score		Difference in mean	Paired "t" test					Interpretation
BT	AT		% Change	S.D	S.E.M	't'	p	
26.30	21.05	5.250	19.96%	3.95867	0.8859	5.931	0.000	HS

Between the group

Comparision of effect on Hb between the groups (*Yava saktu* (Group A) and *Yava-Chanaka saktu* (Group B)

The comparative effect on Hb between the groups. Group A (0.1375) showed better results when compare to Group B (0.1250) which was statistically non significant at p<0.828. Table 5

Table 5 Comparison of effect on Hb between the groups

Group	N	AT-BT	Unpaired 't' test				
			S.D	S.E.M	T	P	Intervention
A	20	0.1375	0.18979	0.04244	0.218	0.828	NS
B	20	0.1250	0.17206	0.03847			

Comparision of effect on ESR between the groups (*Yava saktu* (Group A) and *Yava-Chanaka saktu* (Group B)

The comparative effect on ESR between the groups. Group A (7.950) showed better results when compare to Group (5.250) which is statistically non significant at p<0.158.Table 6

Table 6 Comparison of effect on ESR between the groups

Group	N	AT-BT	Unpaired 't' test				
			S.D	S.E.M	t	P	Intervention
A	20	-7.9500	7.33036	1.63912	-1.449	0.158	NS
B	20	-5.2500	3.95867	0.88519			

❖ **Results on subjective parameters**

➢ **Assessment of *Arogya* or *Swastha Lakshanas***

Within the group (Friedman test)

Effect of *Yava saktu, Yava-Chabnaka saktu* and Control group on assessment of *Arogya Lakshanas* within the group tabulated in Table 7.

Table 7 Assessment of *Arogya* or *Swastha Lakshanas* within the group

Lakshanas	Group A (*Yava Saktu*)			Group B (*Yava-Chanaka Saktu*)			Group C (Control)		
	Mean rank	p value	Interpretation	Mean rank	p value	interpretation	Mean rank	p value	Interpretation
1.*Annabhilasha* (desire for food)	1.03	0.000	HS	1.00	0.000	HS	1.08	0.000	HS
2.*Shareerasya laghavam* (lightness of body)	1.53	0.000	HS	1.48	0.000	HS	1.33	0.000	HS
3.*Sukhaswapnaprabodanam* (comfortable sleep and awakening)	1.58	0.000	HS	1.63	0.000	HS	1.20	0.000	HS
4.*Soumanasya* (calmness or happiness)	1.50	0.000	HS	1.50	0.000	HS	1.00	0.000	HS
5. *Kshut saha* (Tolerance to hunger)	1.45	0.000	HS	1.50	0.000	HS	-	-	-
6.*Pipasa saha* (Tolerance to thirst)	1.35	0.000	HS	1.18	0.000	HS	1.95	0.368	NS
7.*Atapa saha* (Tolerance to heat of sun)	1.00	0.000	HS	1.00	0.000	HS	1.00	0.000	HS
8. *Sheeta saha*	-	-	-	-	-	-	-	-	-
9. *Vyayama saha* (Tolerance to exercise)	1.50	0.000	HS	1.53	0.000	HS	1.00	0.000	HS
10. *Kankshapana* (Desire for drink)	1.00	0.000	HS	1.00	0.000	HS	-	-	-

Between the group (Krushkal wallis)

Effect of *Yava saktu, Yava-Chanaka saktu and* Control group on assessment of *Arogya Lakshanas* between the group tabulated in Table 8.

Table 8 Assessment of *Arogya* or *Swastha Lakshanas* between the group.

Lakshanas	After Treatment_mean			After Follow up_mean		
	Mean Rank	p value	interpretation	Mean Rank	p Value	Interpretation
1.*Annabhilasha* (desire for food)	11.45	0.000	HS	19.93	0.000	HS
2.*Shareerasya Laghavam* (lightness of body)	20.70	0.000	HS	17.53	0.000	HS
3.*Sukhaswapnaprabodanam* (comfortable sleep and awakening)	21.35	0.000	HS	14.40	0.000	HS
4.*Soumanasya* (calmness or happiness)	20.00	0.000	HS	11.00	0.000	HS
5. *Kshut saha* (Tolerance to hunger)	10.50	0.000	HS	20.50	0.000	HS
6.*Pipasa saha* (Tolerance to thirst)	10.50	0.000	HS	17.50	0.000	HS
7.*Atapa saha* (Tolerance to heat of sun)	17.48	1.00	NS	30.50	1.00	NS
8. *Sheeta saha*	30.50	1.00	NS	30.50	1.00	NS
9. *Vyayama saha* (Tolerance to exercise)	17.48	0.000	HS	10.50	0.000	HS
10. *Kankshapana* (Desire for drink)	20.50	0.000	HS	10.50	0.000	HS

> *Klama* **assessment parameters**

Within the group (Friedman test)

Effect of *Yava saktu, Yava-Chanaka saktu* and Control group on *Klama* assessment parameters within the group tabulated in Table 9.

Table 9 *Klama* assessment within the group

Lakshanas	Group A (Yava Saktu)			Group B (Yava-Chanaka Saktu)			Group C (Control)		
	Mean rank	p value	Interpretation	Mean rank	p value	interpretation	Mean rank	p value	Interpretation
1. *Anaayasa Srama* (*Tiredness without work*)	1.50	0.000	HS	1.45	0.000	HS	1.05	0.000	HS
2.*Svasavarjita* (**Absence of forced breathing**)	-	-	-	-	-	-	-	-	-
3. *Kramashah Bala Hrasa* (**Gradual loss of strength**)	1.50	0.000	HS	1.48	0.000	HS	1.00	0.000	HS

Between the group (Krushkal Wallis)

Effect of *Yava saktu, Yava-Chanaka saktu* and Control group on *Klama* assessment parameters between the group tabulated in Table 10.

Table 10 *Klama* assessment between the group

Lakshanas	After Treatment_mean			After Follow up_mean		
	Mean rank	p value	Interpretation	Mean rank	p value	Interpretation
1. *Anaayasa Srama* (*Tiredness without work*)	19.28	0.000	HS	11.45	0.000	HS
2. *Svasavarjita* (**Absence of forced breathing**)	30.50	1.000	NS	30.50	1.000	NS
3. *Kramashah Bala Hrasa* (**Gradual loss of strength**)	17.85	0.000	HS	10.50	0.000	HS

DISCUSSION

❖ Discussion of on objective parameters

Within the group (Friedman test)

In present study, the *Yava Saktu* (Group A) showed improvement in Hb% by 2.6% and was statistically significant with p value 0.004; wherein, *Yava-Chanaka Saktu* (Group B) showed 1% improvement, which was statistically significant with p value 0.004.

It is observed that in Summer the ESR will be raised when *Klama* is present. After giving the *Saktu* the *Klama* was found to be reduced so does the ESR. *Yava- Saktu* (Group A) showed 26.5% decrease in ESR which was statistically highly significant with p value 0.000; wherein, *Yava-Chanaka Saktu* (Group B) showed 19.96% decrease in ESR which was statistically highly significant with p value 0.000.

Both the *Saktus* have shown *Klamahara* an indirect means to reduced the ESR, but *Yava Saktu* has a considerable niche over *Yava-Chanaka Saktu.*

Yava-Chanaka Saktu is more palatable compared to *Yava Saktu,* but for *Klamahara Yava Saktu* is more significant.

So, from above observation it can be stated that *Yava Saktu*(Group A) have shown better improvement in Hb% and ESR when compare to *Yava-Chanaka saktu* (Group B) subjects involved in this study.

Between the group (Krushkal wallis)

Comparative effect on Hb% between the groups, Group A (0.1375) showed better results when compared to Group B (0.1250) which was statistically non significant with p value 0.828 and on ESR also, Group A (7.950) showed better results compared to Group (5.250) which was statistically non significant with p value 0.158.

It may be stated that the Fe content in 20 gm of *Saktu* is negligible and hence observations on Hb % is insignificant in both groups.

❖ **Discussion on subjective parameters**

➢ *Arogya or Swastha Lakshana Assessment parameters*:

Within the group

In Group A (*Yava Saktu*),

In *Annabhilasha*, mean rank before treatment was 2.93, after treatment was 1.03 and after follow up 2.05. Mean rank after treatment was reduced to 1.03 which was statistically highly significant with p value 0.000, which showed increased in appetite, hence *Agni Sandhukshana* by *Saktu* is established.

In *Shareerasya Laghava*, *Soumanasya*, and *Vyayamasaha* mean rank after treatment and follow up was reduced which was statistically highly significant with p value 0.000.

In *Kshuta Saha* and *Pipasa Saha*, as compared to before and after follow up of treatment mean rank after treatment was increased at 3.00, which was statistically highly significant with p value 0.000. As *Yava Saktu* is *Laghu, Deepana*, and *Ruksha* in nature, so in Group A healthy individuals appetite and thirst was increased more after treatment as compared to before and after follow up of treatment.

As in *Grishma Ritu* chances of *Agnimandya* and dehydration will be there due to this by intake of *Yava Saktu* appetite and thirst increased and by these homeostasis maintain.

In *Atapasaha,* mean rank of before and after treatment was 2.50 and after follow up mean rank was reduced to 1.00 as compared to before and after treatment. Improvement was seen after follow up not after treatment. As during treatment average temperature was 34ºC and humidity 64% and during follow up temperature was dropped to 32-

30º C temperature and humidity around 60%.

In *Sheeta Saha* parameter values are not computed.

In Group B *(Yava-Chanaka Saktu),*

Showed similar improvement as that of *Yava Saktu* group. As one of the content is *Yava* and addition of *Chanaka* is to increased palatability so that to fit to all age groups.

In Group C (non interventional),

In *Annabhilasha, Shareerasya Laghavam ,Sukhaswapnaprabodanam, Soumanasya, Atapasaha, Vyayamasaha* mean rank was reduced after follow up as compare to before and after treatment. In costal India, the South-East monsoon starts in the last week of May. In the non interventional group both the before and after treatment were found similar. This period is the period of Summer season with intense heat so the readings didn't change as compare to group A and group B. But in the follow up all three groups showed reduced mean ranking which called which fall in the period of May month. The starting of monsoon was core factor for this unique observation .The coldness of rainy season naturally subdued the *Klama* of Summer season so the reduction in mean ranking for all group is justified.

Between the group

In *Annabhilasha* parameter after treatment (AT) mean, mean rank of Group A was 39.00, Group B-41.04 and Group C-11.45, showed statistically highly significant with p value 0.000. After follow up (AF) mean, mean rank of Group C was 50.30, Group B -21.28 and GroupA-19.93, showed statistically highly significant with p value 0.000.

In *Sukhaswapnaprabodanam*, *Shareersya Laghava*, *Soumanasya* and *Vyamasaha* parameters after treatment (AT) mean, mean rank of Group C was around 46.00 to 50.00, Group B-20 to 24.15 and Group A-17.48 to 24.35, showed statistically highly Significant with p value 0.000. After follow up (AF) mean, mean rank of Group A was around 38.35 to 40.00, Group B -35.63 to 40.50 and Group C -10.50 to 17.53, showed statistically highly significant with p value 0.000.

In *Kshutsaha and Pipaasasaha parameters* after treatment (AT) mean, mean rank of Group A was around 39.50 to 40.68, Group B-40.33 to 41.50 and GroupC -10.50, showed statistically highly significant with p value 0.000.After follow up (AF) mean, mean rank of Group C was around 50 to 50.20, Group A-20.50 to 23.80 and Group B-17.50 to20.50, showed statistically highly significant with p value 0.000.

In *Kankshapana* parameter after treatment (AT) mean rank of Group C-5.50 Group A

&Group B-20.50, showed statistically highly significant with p value 0.000. After follow up (AF) mean, mean rank of Group A &Group B-40.50 and Group C-10.50, showed statistically highly significant with p value 0.000

In *Atapasaha* and *Sheetasaha* parameters after treatment (AT) and after follow up (AF) mean, mean rank of all three Group was 30.50, showed statistically non significant with p value 1.000.

From above observations it can be stated that *Yava Saktu* (Group A) showed better improvement after treatment mean as compared to Group B and C, whereas Control group (Group C) showed better improvement after follow up as compare to Group A and B.

➤ *Klama* **assessment parameters**

Within the group

In Group A *(Yava Saktu),*

In *Anaayasasrama* and *Kramasaha Balahrasa,* mean rank before treatment was 3.00, after treatment1.50 and follow up 1.50. Mean rank after treatment and follow up was reduced to 1.50 which was showed statistically highly significant with p value 0.000. As *Yava saktu* is *Tarpana, Balakara, Brihmana, Ruchya* and *Parinamobalavaha* (yields energy on digestion) showed better improvement in above said parameters.

In Group B (*Yava-Chanaka Saktu)*

In *Anaayasasrama* parameter, mean rank before treatment was 3.00 and after treatment and follow up was reduced to 1.45, which showed statistically highly significant with p value 0.000.

In *Kramasaha Balahrasa* parameter, mean rank before treatment was 3.00 after follow up 1.53, and after treatment reduced to 1.48, which showed statistically highly significant with p value 0.000.

In Group C (control group),

In *Anaayasasrama, and Kramasaha Balahrasa* parameters mean rank before and after treatment was around 2.48 and 2.50 and after follow up reduced to 1.00 which were showed statistically highly significant with p value 0.000.

In *Svasavarjita* parameter values are not computed in all three groups.

From above observation it can be stated that *Yava saktu* (Group A) showed better improvement after treatment and follow up and *Yava-Chanakasaktu* (GroupB) showed better improvement after treatment, in *Anaayasasrama* parameter showed better improvement after treatment and follow up.

Between the group

In *Anaayasasrama* parameter, after treatment (AT) mean, mean rank of Group C was 50.50, Group B-21.33 and Group A-19.68 showed statistically highly significant with p value 0.000.

After follow up (AF) mean, mean rank of Group A was 39.00, Group B - 41.05 and Group C-11.45, showed statistically highly significant with p value 0.000.

In *Kramashah Bala Hrasa parameter*, after treatment (AT) mean, mean rank of Group C-50.50, Group A-23.15, and Group B-17.85 showed statistically highly significant with p value 0.000.

After follow up (AF) mean, mean rank of Group A was 40.00, Group B-1.00 and Group C-10.50, showed statistically highly significant with p value 0.000.

In *Svasavarjita* parameter mean rank of all three groups were 30.50, showed statistically non significant with p value 1.000.

From above observations it can be stated that *Yava Saktu* (Group A) & *Yava-Chanaka Saktu* (Group B) showed better improvement after treatment mean as compared to Group C, whereas Control group (Group C) showed better improvement after follow up as compared to Group A& B.

CONCLUSION

Among preventive medicinal tools; the *Ritucharya* aims to normalize the *Doshas* vitiated by the influence of climatic change. *Ritucharya* (seasonal regimen) is an untapped tool of *Ayurveda* developed to counter seasonal variations and have enough potential to address the global problems caused by climatic change. Simple interventions like *Saktu Kalpana* is more practicable home remedy to address *Klama* and *Balahrasa in Grishma Ritu.* This study revealed a slow and steady acclimatization for *Grishma Ritu* with *Saktu Kalpanas,* even after withdrawal of *Saktu Kalpanas* for a period of 15 days. *Yava-Chanaka Saktu* is more palatable than *Yava Saktu. Yava Saktu* is potential ESR reducer along with a mild increase in Hb% was noted. The behavioural pattern of non interventional group in the period of follow up exhibits natural remission in all parameters.

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