



# **“EFFECT OF RUTU ON SHARIRBALA WITH SPECIAL REFERENCE TO PHYSICAL FITNESS TEST.”**

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## **ABSTRACT:**

Ayurveda is the eternal science having the most important aim of swastasya swastha rakashana i.e. protect the health of healthy individual. Seasonal changes affect the sharirbala i.e. body strength, so everyone have to know the physiological and environmental changes occurs in body season to season. The aim of this study was to assess the effect of Rutu on Sharirbala with the help of Harvard step test. Sample size of 60 volunteers selected by applying inclusion and exclusion criteria. The 6 Rutu explained in Charak samhita were considered for the research. Sharirbala was examined with Harvard step test.

**KEYWORDS:** Rutu ,Sharirbala, Harvard step test

## **INTRODUCTION:**

In present era everyone is facing various stressful experiences in life because of changes in lifestyle and mental stress from the work to achieve the success. Human being life style is going to change continuously by that has no time even for taking balanced diet and person does not get proper nutrition, due to this immunity of person lowered. So everyone is trying to have the fitness and maintain the the proper health.

One out of two aims of Ayurveda one is ‘Swasthyarakshana’ i.e. maintenance of health. In spite of mentioning all these important aspects for keeping human life healthy, Ayurveda always had a big emphasis on maintenance of Sharirbala.

Human is unable to control environmental changes due to season (Rutu). He has no capacity to control the motion of celestial bodies like Sun, Moon etc. They make tremendous impact on human physiology. Considering this, Charaka-Samhita prescribed regimen of every season (Rutu) so that a human can stand the changes in the seasons (Rutus) with keeping the sharirbala stable. Ayurveda explains the importance of regimen as per the Rutus so by practicing these regimens one can maintain the proper health as well as the sharirbala. In this

research focused on the variabilities on the sharirbala during all the Rutus, so one can adopt the regimens tild in Ayurvedic literatures so that in this modern era also we can make the Swastasya swasthya rakshana i.e. maintain the health of healthy one.

### **AIM:**

To study the effect of Rutu on Sharirbala with the help of Ayurvedic literature and modern literature.

### **OBJECTIVES:**

- 1) To study the effect on Sharirbala from person to person in each Rutukala with the help of Harvard step test.
- 2) To study effect on Sharirbala from person to person in each Rutusandhikala with the help of Harvard step test.

### **MATERIAL:**

#### **1) SAMPLE SIZE**

Record of 60 healthy volunteers in each Rutukala and Rutusandhikala are taken.

#### **• INCLUSION CRITERIA**

1. Healthy volunteers in between 20 – 50 years age group.
2. Volunteers will be irrespective of cast and religion and which belongs to same social and economical class.
3. Volunteers selected from Sadharana desha.

#### **• EXCLUSION CRITERIA**

1. Person suffering from any disease related to digestive system, cardiovascular system etc.
2. Mental retarded people.
3. Pregnant and lactating women.

### **2) RUTU**

- 1) Informed permission about performing the thesis work on 60 healthy volunteers in age group 20-50 year from Sadharan Desh.
- 2) The 6 Rutu explained in Charak samhita are considered for the research.
- 3) The particular Lakshanas of each Rutu are taken from the Bruhatrayee.
- 4) The dates of beginning and end of these months will be decided through Marathi Panchanga published by Sholapur by the recognized honorable Mr.Date.
- 5) The Rutukala and Rutusandhikala period of each Rutu is decided according to-A.S.Su.4/61

### **3) BALA**

- 1) Bala is consired as Vyayamshakti explained in Cha. Vi. 8/121
- 2) The Balapareeksha is done according to the Cha .vi. 8/121
- 3) The Sharirbala pareeksha is done by the physical fitness test i.e. with Harvard step test at rutukala and rutusandhikala of each rutu.

Instruments required-

Metronome, 18inch and 20 inch high bench,  
Stopwatch, pulsoximeter.

## METHODS FOR OBSERVATION OF SHARIRBALA :

### HARVARD STEP TEST:

In this test the male subjects step up and down on 20 inch high bench 30 times for 4 minute. Female steps up and down on 18 inch high bench 30 times for 4 minute. The rate is fixed with the help of metronome. Ask the subject to step up and down by adjusting the rate with the metronome. If he gets exhausted earlier, note the duration for which he was able to perform the test. At the end of the test ask the subject to sit immediately. Count the pulse and record it during 1-1.5 minutes, 2-2.5 minutes and 3-3.5 minute interval. To calculate the fatigue index use the following formula,

$$\text{Index} = \frac{\text{Duration of exercise in sec.}}{2 \times (\text{sum of pulse counts during recovery})} \times 100$$

- 1) Duration of exercise = ..... Sec.
  - 2) 1st pulse count = ..... /min
  - 3) 2nd pulse count = ..... /min
  - 4) 3rd pulse count = ..... /min
- Sharirbala is assessed with help of physical fitness test.

Classification of fitness according to index:

- 1) Below 55 : Poor
- 2) 55 -64 : Low average
- 3) 65-79 : Average
- 4) 80-89 : Good
- 5) 90 and above : Excellent

Gradation for Sharirbala:

Excellent - Uttambala

Good - Uttambala

Average - Madhyambala

Low average- Heenbala

Poor - Heenbala

**OBSERVATION:**

Effect of Rutu on Sharirbala according to Ayurvedic concept:

Rutu- Bala	Shishir		Vasant		Grishma		Varsha		Sharad		Hemant	
	S	M	S	M	S	M	S	M	S	M	S	M
Uttam(Grade01)	16	16	17	14	5	6	11	2	12	4	17	33
Madhyam (Grade02)	39	30	25	28	16	7	12	13	30	32	25	17
Heen(Grade03)	5	14	18	18	39	47	37	45	18	24	18	10

\*(S: Sandhikala, M: Rutukal)

- 1) In Shishirrutu Sandhikala 16(26.66%) volunteers of Uttam Sharirbala , 39(65%) Volunteers are of Madhyam Sharirbala and 5 (8.33%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Hemantrutu Sandhikala.
- 2) In Shishirrutukala 6(10%) volunteers of Uttam Sharirbala, 30(50%) Volunteers are of Madhyam Sharirbala and 14 (23.33%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Shishirrutukala.
- 3) In Vasantrutu Sandhikala 17(28.33%) volunteers of Uttam Sharirbala, 25(41.66%) Volunteers are of Madhyam Sharirbala and 18 (30%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Vasantrutu Sandhikala.
- 4) In Vasantrutukala 14(23.33%) volunteers of Uttam Sharirbala, 28(46.66%) Volunteers are of Madhyam Sharirbala and 18(30%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Vasantrutukala.
- 5) In Grishmarutu Sandhikala 5(8.33%) volunteers of Uttam Sharirbala, 16(26.66%) Volunteers are of Madhyam Sharirbala and 39 (65%) volunteers are of Heen Sharirbala. So there is Heen Sharirbala in Grishmarutu Sandhikala.
- 6) In Grishmarutukala 6(10%) volunteers of Uttam Sharirbala, 7(11.66%) Volunteers are of Madhyam Sharirbala and 47(78.33%) volunteers are of Heen Sharirbala. So there is Heen Sharirbala in Grishmarutukala.
- 7) In Varsharutu Sandhikala 11(18.33%) volunteers of Uttam Sharirbala, 12(20%) Volunteers are of Madhyam Sharirbala and 37 (61.66%) volunteers are of Heen Sharirbala. So there is Heen Sharirbala in Varsharutu Sandhikala.
- 8) In Varsharutukala 2(3.33%) volunteers of Uttam Sharirbala, 13(21.66%) Volunteers are of Madhyam Sharirbala and 45(75%) volunteers are of Heen Sharirbala. So there is Heen Sharirbala in Varsharutukala.
- 9) In Sharadrutu Sandhikala 12(20%) volunteers of Uttam Sharirbala, 30(50%) Volunteers are of Madhyam Sharirbala and 18 (30%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Sharadrutu Sandhikala.
- 10) In Sharadrutukala 4(6.66%) volunteers of Uttam Sharirbala, 32(53.33%) Volunteers are of Madhyam Sharirbala and 24(40%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Sharadrutukala.

11) In Hemantrutu Sandhikala 17(28.33%) volunteers of Uttam Sharirbala, 25(41.66%) Volunteers are of Madhyam Sharirbala and 18 (30%) volunteers are of Heen Sharirbala. So there is Madhyam Sharirbala in Hemantrutu Sandhikala.

12) In Hemantrutukala 33(55%) volunteers of Uttam Sharirbala, 17(28.33%) Volunteers are of Madhyam Sharirbala and 10(16.66%) volunteers are of Heen Sharirbala. So there is Uttam Sharirbala in Hemantrutukala.

## CONCLUSION:

### a) Statistical analysis:

**Statistical analysis-** For testing of hypothesis, “Kruskal – Wallis test” with dunn test as post hoc (if significant difference is observed) has been used. Level of significance has been kept at 5% for all tests.

Rutu Bala	Kala	Kruskal-Wallis statistic	d.f.	P- Value
Rutu sharirbala	Sandhikala	46.138	5	< 0.001
	Rutukala	93.996	5	< 0.001

Pairwise comparison (P-values)	Shishir	Vasant	Greeshma	Varsha	Sharad
Vasant	< 0.001				
Greeshma	< 0.001	0.340			
Varsha	< 0.001	0.418	0.418		
Sharad	0.286	0.002	< 0.001	0.001	
Hemant	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

### 1) Effect of Rutu on Sharirbala:

#### a. Sandhikala

For sandhikala, there is significant difference between sharirbala of various Rutus as suggested by Kruskal- Wallis test (P-value < 0.001). The Dunn test for pairwise comparison provides following result:

Rutu	Sharirabala (Sandhikala)		Significantly different sharirbala than
	Mean grade	Median grade	
Shishir	1.8	2.0	Greeshma, Varsha, Sharad
Vasant	2.0	2.0	Greeshma, Varsha
Greeshma	2.6	3.0	Vasant, Sharad, Hemant, Shishir

Varsha	2.4	3.0	Vasant, Sharad, Hemant, Shishir
Sharad	2.1	2.0	Varsha, Greeshma, Shishir
Hemant	2.0	2.0	Greeshma, Varsha

Post Hoc test : Dunn test for Rutu \* Sharirbala (Sandhikala):

Pairwise comparison (P-values)	Shishir	Vasant	Greeshma	Varsha	Sharad
Vasant	0.053				
Greeshma	< 0.001	< 0.001			
Varsha	< 0.001	< 0.001	0.184		
Sharad	0.016	0.298	< 0.001	0.004	
Hemant	0.053	0.500	< 0.001	< 0.001	0.298

#### b. Rutu kala:

For Rutukala, there is significant difference between sharirbala of various Rutus as suggested by Kruskal- Wallis test (P-value < 0.001). The dunn test for pairwise comparison provides following result:

Rutu	Sharirbala (Madhyakala)		Significantly different sharirbala than
	Mean grade	Median grade	
Shishir	2.0	2.0	Greeshma, Varsha, Sharad, Hemant
Vasant	2.1	2.0	Greeshma, Varsha, Sharad, Hemant
Greeshma	2.7	3.0	Vasant, Sharad, Hemant, Shishir
Varsha	2.7	3.0	Vasant, Sharad, Hemant, Shishir
Sharad	2.3	2.0	Vasant, Varsha, Greeshma, Hemant, Shishir
Hemant	1.6	1.0	Vasant, Varsha, Greeshma, Sharad, Shishir

Post Hoc test : Dunn test for Rutu \* Sharirbala (Madhyakala):

Pairwise comparison (P-values)	Shishir	Vasant	Greeshma	Varsha	Sharad
Vasant	0.233				
Greeshma	< 0.001	< 0.001			
Varsha	< 0.001	< 0.001	0.455		
Sharad	0.006	0.039	0.002	0.001	
Hemant	0.015	0.002	< 0.001	< 0.001	< 0.001

**RESULT:**

1. The majority of Uttam Sharirbala is observed in Hemantrutukala and Hemantrutu Sandhikala,Vasantrutu Sandhikala.
2. The majority of Madhyam Sharirbala is observed in Vasantrutu Sandhikala and Sharadrutukala.
3. Heen Sharirbala is observed in Grishma rutukala and Varsharutukala.

**DISCUSSION:**

The Visarga period is Somya. The sun moves to south. Its power decreased by clouds, wind and rain . In Hemant Rutu due to cold environment the Dehoshma get obstructed in the body which increases the Jatharagni, So due to the increased Jatharagni body needs more Brahana and Snigdha Ahar and because of that the dhatu gets proper nourishment which in term increases the sharirbala. During Adana Kala the digestion become poor which is further disturbed by the Vata disorders etc. during rainy season. Due to earth vapors, humidity of clouds and Amla paka of water the digestive power becomes weak leads to improper nourishment of dhatu leads to decreased sharirbala. According to fatigue Index of Harvard Step Test the excellent Bala is seen majority in Sandhikala of sharad Rutu, good Bala is seen majority in Sandhikala of Vasant , Average Bala is ssen in Sandhikala of Shishir, Low average Bala is seen in Rutukala of Varsha and Poor bala is seen majority in Rutukala of Grishmarutu. By following the regimen according to the rurtu i.e. Rutucharya told in Ayurvedic literatures one can restore the sharirbala and the aim of Ayurveda can be fulfilled.

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