

## TO STUDY THE EFFECT OF *BHUJANGASANA* AND NEUTRAL WATER SPINAL BATH IN MANAGEMENT OF *KATIGRAHA* W.S.R TO LUMBAR SPONDYLITIS

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### ABSTRACT

In India *Katishula* is becoming major health problem, affecting approximately 60-80% of adults during some point of their life. Bad posture, excessive stress, ageing problems and mechanical dAmage may all contribute to back pain. *Katigraha* which is correlated with Lumbar Spondylitis is inflammatory condition affecting the disc, some vertebral bodies or associated joints of lumbar spine .In the current study assessment of *Bhujangasana* and Neutral water spinal bath in management of *Katigraha* w.s.r to Lumbar Spondylitis has been attempted. 30 patients of either sex were selected and divided into two groups. The “Group ‘A’” received *Bhujangasana* and “Group B” received *Bhujangasana* and Neutral Water Spinal bath for 30 days. The results were statistically analyzed and compared.

**Key words:** *Katigraha*, Lumbar Spondylitis

### INTRODUCTION

*Katigraha* is one of the common symptom where person suffering day to day life due to stress, strain and sedentary life style. It is also due to lack of exercise and improper nutrition. *Vatavyadhi* is one of the most prevailing health problems in our day to day clinical practice. An independent disease as *Katigraha* is described in *Gadanigraha* where *Vata* along with *Ama* settles in *kati* and causes pain in that region<sup>1</sup>. According to Acharya Sharangdhara, *Katigraha*

is *VatajananatAmajavyadhi*<sup>2</sup>. So, prime importance should be given to *Vatadosha* while considering the management of disease.

*Katigraha* is one among the *Nanatmajavyadhi*. The *Nanatmajavikara* can be categorized as *Akarmanyatapradhana* (loss of function predominant), *kampapradhana* (tremors dominant), *shulapradhana* (pain dominant), *shoshapradhana* (wasting) degeneration predominant

or *stambhapradhana* (stiffness predominant). *Katigraha* is *shoshastambha* and *shula* predominant *vyadhi*. As said by *Sushrutaacharya* without vitiation of *Vata*, *shula* cannot be produced. As *Gadanigraha* clearly states pain is produced due stiffness produced by *sama* or *niramavayu* movement in to *kati* hence this suggest of presence of *dhatukshayatmaka* and *margaavarodha* type of *samprapti*.

Lumbar spondylitis is a term used to describe a Group Arthritis based spine condition that cause inflammation in the vertebrae and sometimes joints of the spine. Spondylitis generally occurs in the lowest section of the lumbar spine the sacroiliac joint that connects the pelvis to the spine. One of the most common forms of spondylitis found in the SI joint is ankylosing spondylitis. Patients diagnosed with spondylitis may experience a range of symptoms including immobility of the spine, decrease range of motion, chronic pain and deformed spine curvature<sup>3</sup>.

*Bhujangasana* is one among the corrective asana. *Bhujangasana* means cobra in Sanskrit .When this pose is exhibited, the raised head and trunk resemble the raised hood of cobra. Hence this is called *Bhujangasana*. It is clearly indicate in management of relocate slipped disc, remove backache.<sup>4</sup>

Nature cure is a constructive method of treatment which aims at removing the basic cause of diseases through the rational use of the elements freely available in nature. It is not only a system of healing but also a way of life in tune with the internal vital forces or natural elements comprising the human body. It is a complete revolution in the art and science of living. Hydrotherapy aids the rehabilitation process in in-

juries and stroke and it improves respiratory infections. Hydrotherapy is also known to **reduce pain and inflammation** in arthritis and other rheumatological conditions. In addition hydrotherapy reduces the effects of stress by increasing endorphin production, improves sleep and prevent headaches. Recent studies also show that cold water treatment, including swimming are potential effective treatments for depression also offer **pain relief**. In patients undergoing strength training, hydrotherapy has also been found to improve recovery. Neutral water spinal bath is one among the Naturopathy treatments.

Statistically it is estimated that about 60-80 % of world population experience back pain at sometimes in their lives<sup>5</sup> and many of us live with chronic symptoms. Lumbar spondylitis is an inflammatory condition of lumbar vertebrae or associated joints of lumbar spine and stiffness pain in back<sup>6</sup>. Low back pain is referred to as the second frequent reason for visiting a doctor, third frequent reason for surgery and 5<sup>th</sup> frequent reason for hospitalization. Amount of working hours lost due to back pain has increased 2-3 times in past 20 yrs. Thus it can be clearly seen that *Katigraha* or lumbar spondylitis negatively affects the productivity of the individual himself as well as that of society and the country. The later may often produce the former or at least lead to physical discomfort such bodily pains or discomfort can be easily detected by gestures of very frequent readjustment of posture of person<sup>7</sup>. The relaxing bath like Neutral Water Spinal Bath (temperature of water is 34 -36 degree Celsius) also soothes the nervous system, back muscle and low back sprain.

Keeping in mind the high prevalence rate of disability in productive span of life, intensity

of symptoms of disease, lack of current effective treatment, and the clinical trial was conducted to assess the efficacy of *Bhujangasana* and Neutral Water Spinal Bath in management of *Katigraha* w.s.r to Lumbar Spondylitis. In both the groups (Group 'A' - *Bhujangasana*, Group 'B' - *Bhujangasana* and Neutral water spinal bath) significant result were observed and improvement in cardinal symptom of *Katigraha* was observed. There was also improvement in restriction in movement and pain intensity. This procedure affects to provide good clinical improvement in pacifying pure *Vataja/Vata kaphaja* type of *Katigraha*.

#### Aim and objectives

1. Assessment of the clinical efficacy of *Bhujangasana* in *Katigraha*.
2. Assessment of combined clinical efficacy of Neutral water spinal bath with *Bhujangasana*.
3. Assessment of comparison effect of both the treatment modalities w.s.r to lumbar spondylitis.

#### Material and Methods

##### Plan of study

1. **Literary contrive:** Though *Katigraha* has not been described as separate diseases in classics except for *Gadanigraha* it has been mentioned as a symptom when *Katigraha* is a diseases by itself having *lakshanasamuchaya* (group of symptoms) that was studied from the available Ayurvedic literature and lumbar spondylitis was studied from available modern medical literature, as to its etiopathogenesis and available treatment modalities.
2. **Clinical contrive:** Patients attending the OPD and IPD of the Swasthavritta Department of JGCO Ayurvedic Hospital, Ghataprabha and the patients referred by the other

department having signs and symptoms of *Katigraha* and patient from JGCO Naturopathy Hospital.

3. **Ethical committee clearance** - freely given informed written consent had been obtained from every subject prior to research participation in accordance with the applicable law. As this is a clinical research, Institutional Ethical Committee (IEC) approval was requested for the protocol prior to initiation of research. Then the available data was assessed using suitable statistical analysis method i.e. **paired t-test**.
4. **Selection of patients:** Patients who report to OPD and IPD of JGCO Ayurvedic Hospital, Ghataprabha were carefully selected on the basis of diagnosis, inclusion and exclusion criteria etc.
5. **Diagnostic criteria-** Patients having the clinical picture of progressive spinal stiffness, episodic back pain (more than a month), tenderness, prolapse (1<sup>st</sup> and 2<sup>nd</sup> degree) with or without nerve root irritation with inflammatory changes on x-ray of lumbar spine (AP view and lateral view) and fulfill the Aberdeen low back pain scale were recruited

##### Inclusion criteria

- Patient of either sex and of age between 20 -50 yrs.
- Fulfilling the diagnostic criteria having signs and symptoms of *Katigraha* (lumbar spondylitis)
- Individuals with a history of injury and/or complex medical problems should always seek a class with an experienced and certified instructor.
- Patients should be empty stomach before *Bhujangasana*.

### Exclusion criteria

-Patients having spinal tumour, malignant diseases of the pelvis, tuberculosis of vertebral bodies, recent lumbar region surgery or implanted instrumentation/ prosthesis other chronic metabolic pathologies i.e. Ankylosing spondylosis, Rheumatoid arthritis, gouty arthritis, epilepsy or any other serious systemic illness etc. were excluded from the study investigation -these were also before and after treatment.

- The person who is suffering from peptic ulcers, hernia, intestinal tuberculosis, and hypothyroidism shouldn't practice this asana.

- One having abdominal injuries should also avoid doing this.

-The patients of sciatica, slip-disc and ulcerative colitis should take extra precautions. It also shouldn't be performed during pregnancy.

**Routine hematological investigation:** ESR, TLC, FBS, PPBS, X-ray of the lumbar spine.

### Study design Description

**Method of grouping patients:** The patients from OPD and IPD of the JGCO AMC, Ghataprabha were randomly divided into following groups:

**Group 'A'** -*Bhujangasana* (2 times in a day for 5 minutes, before meal) (Duration is 30 days)

**Group 'B'** - Neutral water spinal bath (once in a day) for 15 minutes along with *Bhujangasana* (2 times in a day, before meal). (Duration is 30 days)

### Criteria for Assessment

1. Clinical features of *Katigraha* were assessed during treatment in 15 days till the end of treatment.

2. Changes in coin test before and after treatment

3. Changes in X-ray before and after treatment  
4. Changes in blood investigation before and after treatment

**Katigraha:** 0 - no restriction of movements, 1 - Restriction in any one movement of above, 2 - Restriction in any 2 movements, 3 - Restriction in any 3 movements

**Katishula:** 0 - no pain, 1 - Localized, recurrent, mild pain in back, not radiating to legs, exaggerated by walking and lifting weight, completely relieved by rest., 2 - Recurrent, mild but uncomfortable pain in back, radiating to one/both legs, exaggerated by movement, subsided by rest, 3- Moderate but dreadful pain in the back, with/without radiation, exaggerated by bending, not relieved by rest, relieved by fomentation and massage, not disturbing sleep.

**Sparshaasahisnuta:** 0 - No tenderness, 1 - Mild tenderness without any sudden response on pressure, 2 - Wincing of face on pressure due to tenderness, 3 - Wincing of face withdrawal of affected part on pressure

**Coin test:** 0 - Patient will pick up the coin from floor without any difficulty, 1 - Patient unable to take coin from 5 inch distance from ground, 2 - Patient unable to take coin from 1 feet distance from ground, 3 - Patient unable to take coin from 2 feet distance from ground

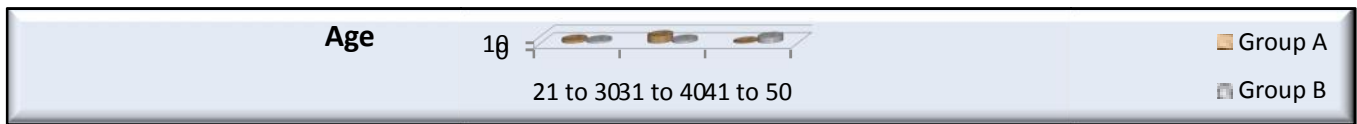
**Restriction in movement of kati:** 0 - No difficulty in any movement of *kati*, 1 - Difficulty in only forward movement of *kati*, 2 - Difficulty in both forward and backward movement of *kati*, 3 - Difficulty in forward, backward and lateral movement of *kati*

### Observations & Results

**Table1:** Frequency distribution of patients according to Age

Age Group	Group 'A'	%	Group B	%
21- 30	4	26.67	3	20.00
31- 40	10	66.67	4	26.67
41- 50	1	6.67	8	53.33
Total	15	100.00	15	100.00

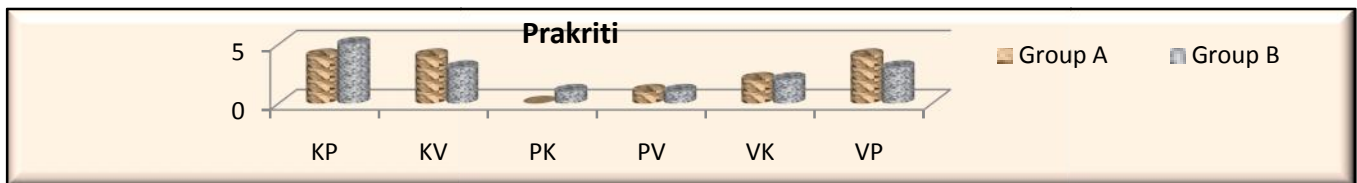
**Graph No 1**



**Table2:** Frequency distribution of patients according to Prakriti

Prakriti	Group 'A'	%	Group B	%
KP	4	26.67	5	33.33
KV	4	26.67	3	20.00
PK	0	0.00	1	6.67
PV	1	6.67	1	6.67
VK	2	13.33	2	13.33
VP	4	26.67	3	20.00
Total	15	100.00	15	100.00

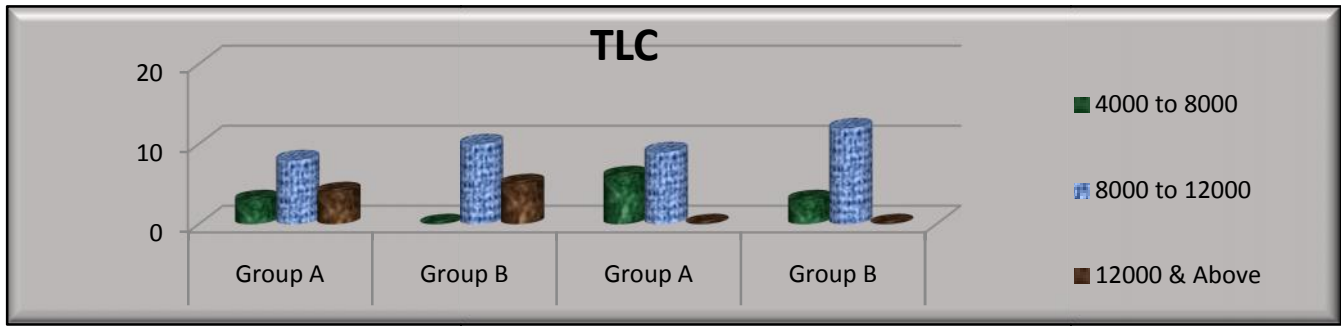
**Graph No 2**



**Table 3:** Frequency distribution of patients according to TLC

TLC	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
4000-8000	3	0	6	3
%	20.00	0.00	40.00	20.00
8000-12000	8	10	9	12
%	53.33	66.67	60.00	80.00
12000 <	4	5	0	0
%	26.67	33.33	0.00	0.00
Total	15	15	15	15

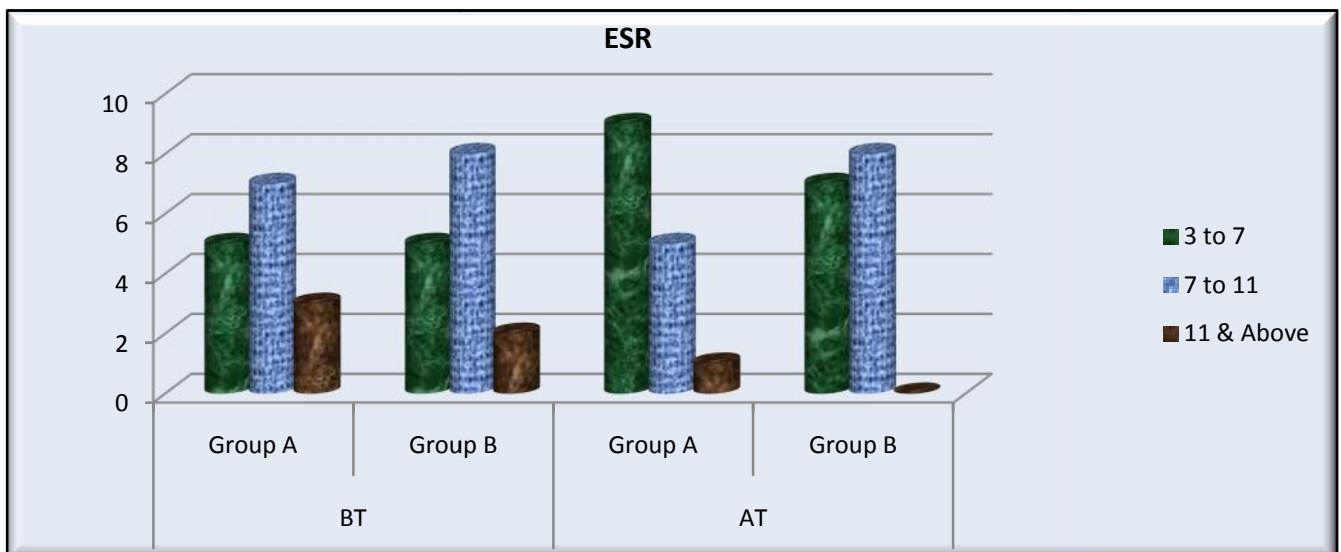
**Graph No 3**



**Table 4:** Frequency distribution of patients according to ESR

ESR	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
3- 7	5	5	9	7
%	33.33	33.33	60.00	46.67
7- 11	7	8	5	8
%	46.67	53.33	33.33	53.33
11<	3	2	1	0
%	20.00	13.33	6.67	0.00
Total	15	15	15	15
%	100	100	100	100

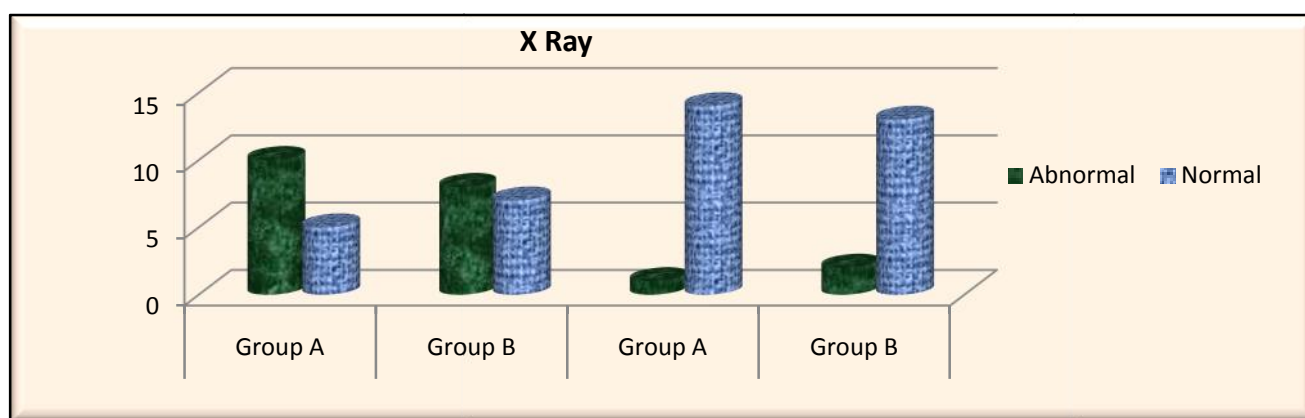
**Graph No 4**



**Table 5:** Frequency distribution of patients according to X Ray

X Ray	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
Abnormal	10	8	1	2
%	66.67	53.33	6.67	13.33
Normal	5	7	14	13
%	33.33	46.67	93.33	86.67
Total	15	15	15	15
%	100	100	100	100

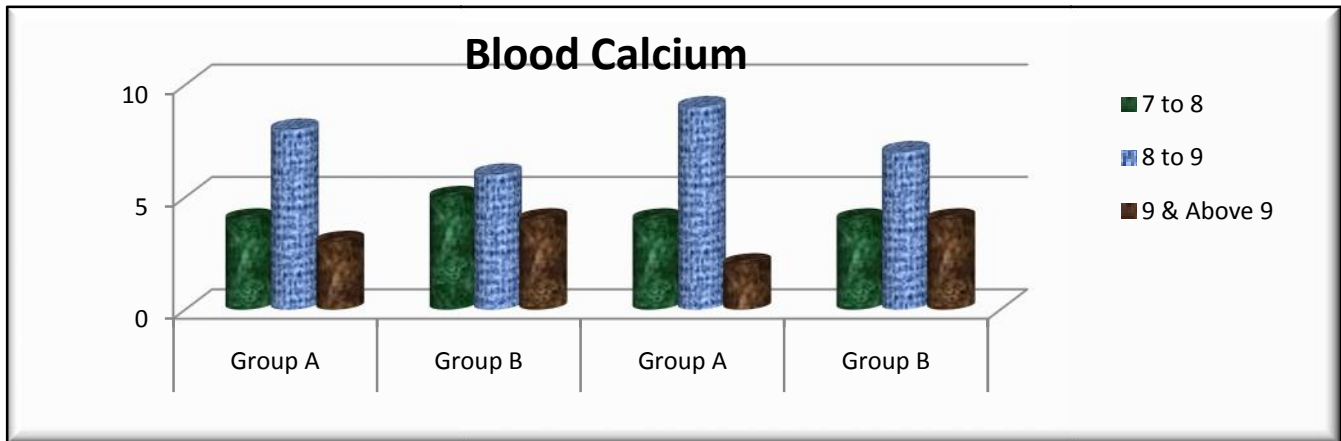
**Graph No 5**



**Table 6:** Frequency distribution of patients according to Blood Calcium

Blood Calcium	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
7-8	4	5	4	4
%	26.67	33.33	26.67	26.67
8-9	8	6	9	7
%	53.33	40.00	60.00	46.67
9<	3	4	2	4
%	20.00	26.67	13.33	26.67
Total	15	15	15	15
%	100	100	100	100

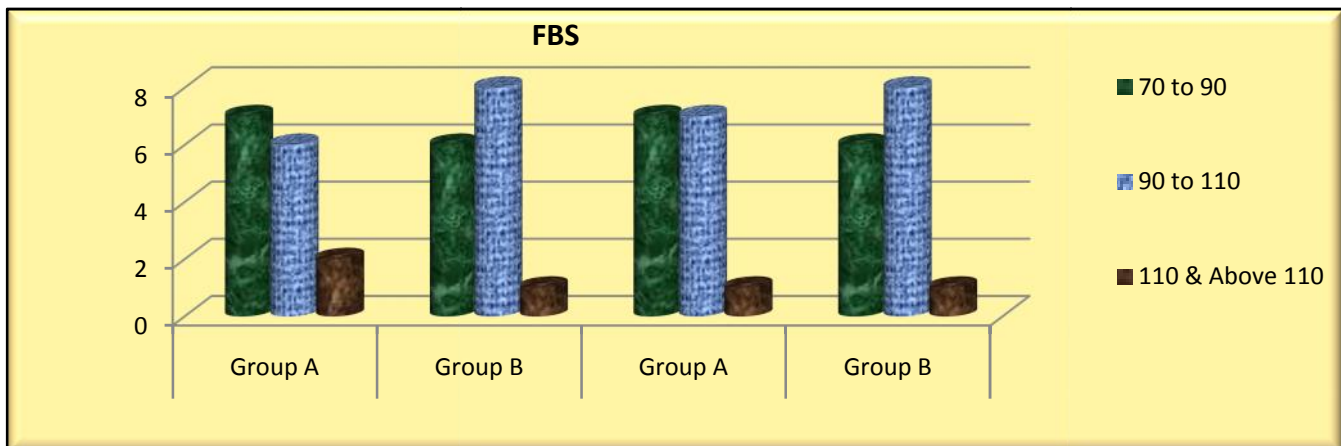
**Graph No 6**



**Table 7:** Frequency distribution of patients according to FBS

FBS	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
70-90	7	6	7	6
%	46.67	40.00	46.67	40.00
90-110	6	8	7	8
%	40.00	53.33	46.67	53.33
110<	2	1	1	1
%	13.33	6.67	6.67	6.67
Total	15	15	15	15
%	100	100	100	100

**Graph No 7**

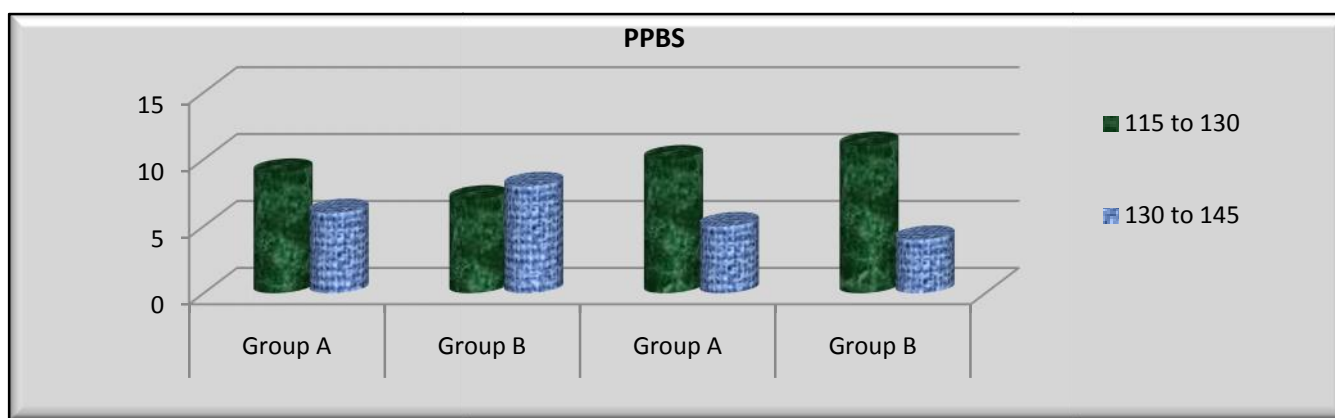




**Table 8:** Frequency distribution of patients according to PPBS

PPBS	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
115-130	9	7	10	11
%	60.00	46.67	66.67	73.33
130-145	6	8	5	4
%	40.00	53.33	33.33	26.67
Total	15	15	15	15
%	100	100	100	100

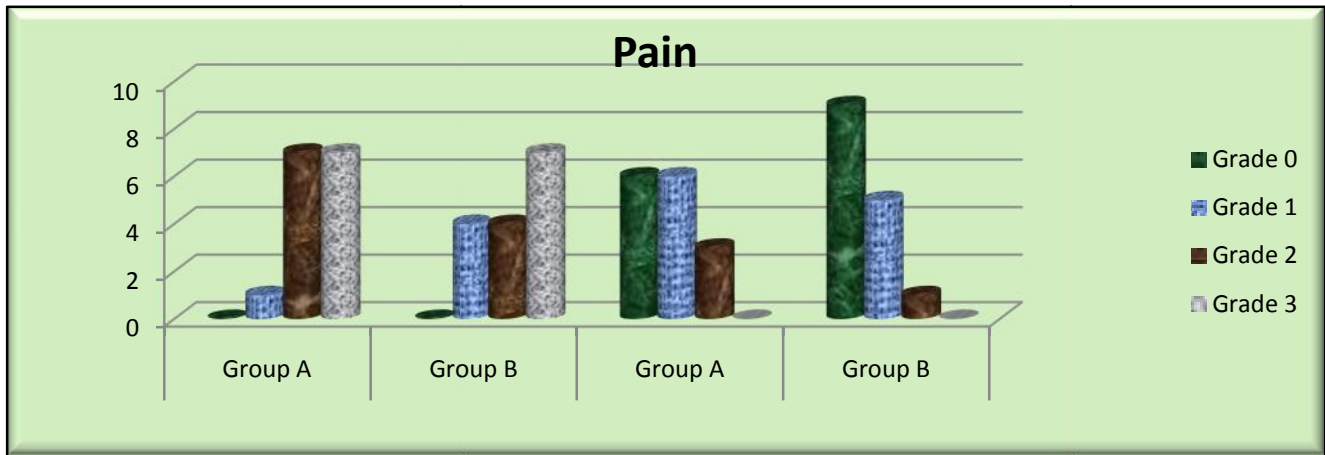
**Graph No 8**



**Table 9:** Frequency distribution of patients according to Pain

Pain	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
Grade 0	0	0	6	9
%	0.00	0.00	40.00	60.00
Grade 1	1	4	6	5
%	6.67	26.67	40.00	33.33
Grade 2	7	4	3	1
%	46.67	26.67	20.00	6.67
Grade 3	7	7	0	0
%	46.67	46.67	0.00	0.00
Total	15	15	15	15
%	100	100	100	100

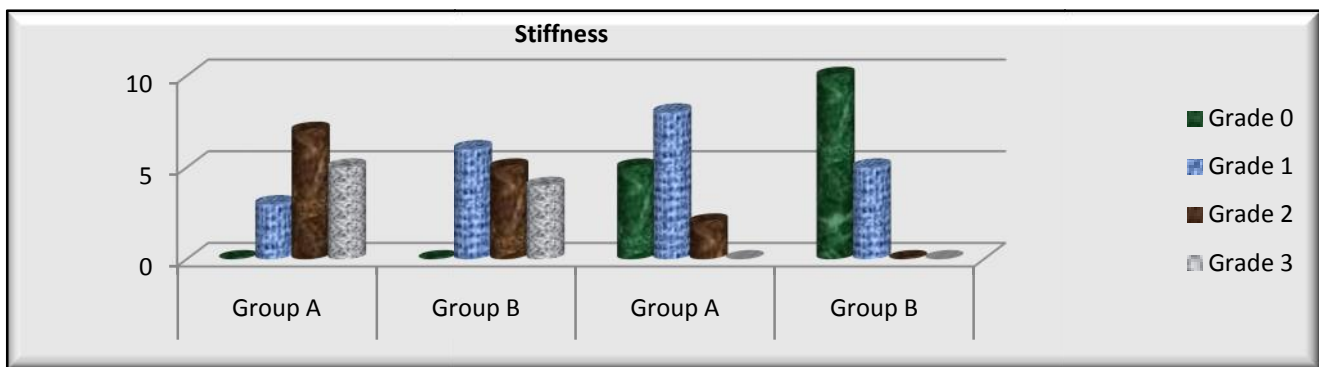
**Graph No 9**



**Table10:** Frequency distribution of patients according to Stiffness

Stiffness	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
Grade 0	0	0	5	10
%	0.00	0.00	33.33	66.67
Grade 1	3	6	8	5
%	20.00	40.00	53.33	33.33
Grade 2	7	5	2	0
%	46.67	33.33	13.33	0.00
Grade 3	5	4	0	0
%	33.33	26.67	0.00	0.00
Total	15	15	15	15
%	100	100	100	100

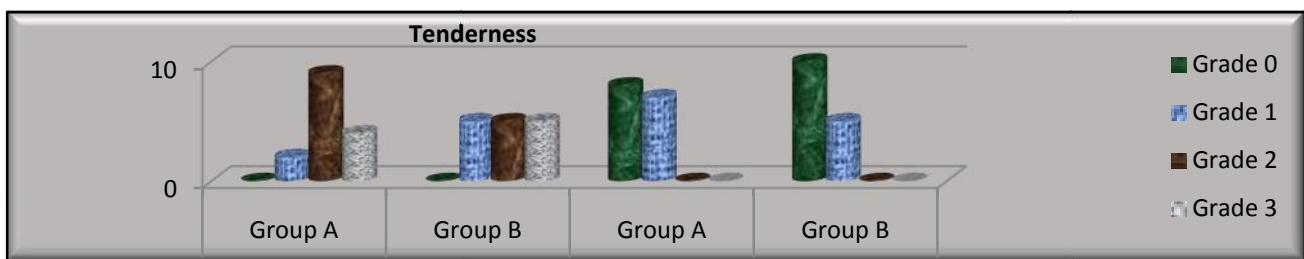
**Graph No 10**



**Table 11:** Frequency distribution of patients according to Tenderness

Tenderness	BT	AT	Tenderness	BT
	Group 'A'	Group B		Group 'A'
Grade 0	0	0	Grade 0	0
%	0.00	0.00	%	0.00
Grade 1	2	5	Grade 1	2
%	13.33	33.33	%	13.33
Grade 2	9	5	Grade 2	9
%	60.00	33.33	%	60.00
Grade 3	4	5	Grade 3	4
%	26.67	33.33	%	26.67
Total	15	15	Total	15

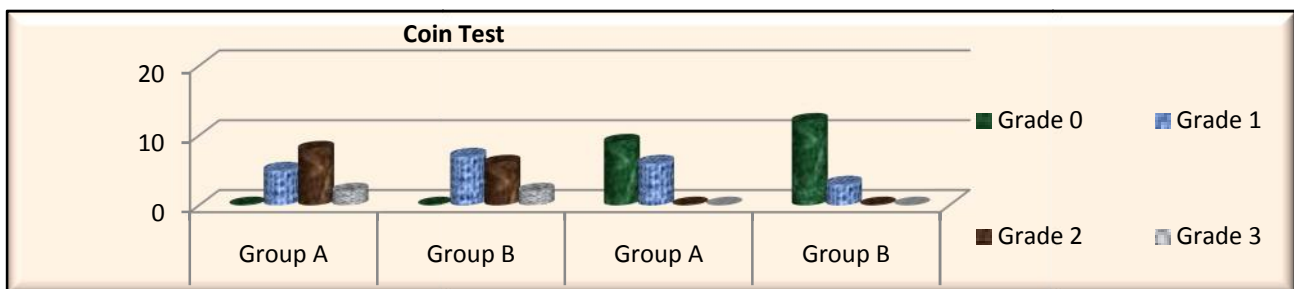
**Graph No 11**



**Table 12:** Frequency distribution of patients according to Coin Test

Coin Test	BT	AT	Group 'A'	Group B
	Group 'A'	Group B		
Grade0	0	0	9	12
%	0.00	0.00	60.00	80.00
Grade1	5	7	6	3
%	33.33	46.67	40.00	20.00
Grade2	8	6	0	0
%	53.33	40.00	0.00	0.00
Grade3	2	2	0	0
%	13.33	13.33	0.00	0.00
Total	15	15	15	15

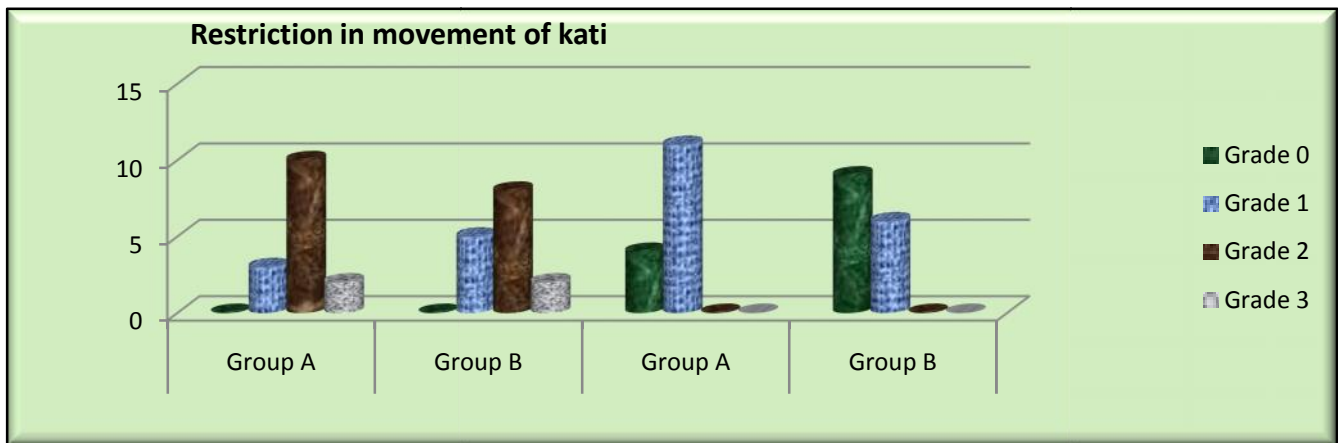
**Graph no. 12**



**Table 13:** Frequency distribution of patients according to Restriction in movement of *kati*

Restriction in movement of <i>kati</i>	BT		AT	
	Group 'A'	Group B	Group 'A'	Group B
Grade 0	0	0	4	9
%	0.00	0.00	26.67	60.00
Grade 1	3	5	11	6
%	20.00	33.33	73.33	40.00
Grade 2	10	8	0	0
%	66.67	53.33	0.00	0.00
Grade 3	2	2	0	0
%	13.33	13.33	0.00	0.00
Total	15	15	15	15
%	100	100	100	100

**Graph No 13**



**Statistical analysis:**

**Between Groups:**

**Table No 14:** The test used is **t-test** for two independent samples.

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	P value (2-tailed)
TLC	Equal variances assumed	.047	.831	-1.106	28	.278
	Equal variances not assumed			-1.106	28.0	.278

ESR	Equal variances assumed	.620	.438	.145	28	.885
	Equal variances not assumed			.145	24.505	.886
Blood calcium	Equal variances assumed	.058	.811	1.364	28	.183
	Equal variances not assumed			1.364	27.687	.183
FBS	Equal variances assumed	1.689	.204	.354	28	.726
	Equal variances not assumed			.354	25.378	.727
PPBS	Equal variances assumed	2.740	.109	.894	28	.379

Since p value > 0.05, the level of significance for all factors; there is no sufficient evidence to reject the null hypothesis for all the factors.

**Table No 15:** - The test used is **Mann Whitney test** for two independent samples.

Test Statistics					
	Pain	Stiffness	Tenderness	Coin test	Restriction in movement of <i>kati</i>
Mann-Whitney U	100.500	94.000	112.500	105.000	93.000
Wilcoxon W	220.500	214.000	232.500	225.000	213.000
Z	-.580	-.872	.000	-.362	-.960
P value (2-tailed)	.562	.383	1.000	.717	.337
a. Grouping Variable: Groups					
b. Not corrected for ties.					

Since p value > 0.05, the level of significance for all factors; there is no sufficient evidence to reject the null hypothesis for all the factors.

**Table No 16: Group ‘A’:** The test used is paired **t-test**.

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	TLC BT - TLC AT	1466.66667	990.43040	255.72803	5.735	14	.000
Pair 2	ESR BT - ESR AT	1.20000	1.47358	.38048	3.154	14	.007
Pair 3	Blood calcium BT -Blood calcium AT	-.00667	.07037	.01817	-.367	14	.719
Pair 4	FBS BT - FBS AT	.66667	2.12692	.54917	1.214	14	.245
Pair 5	PPBS BT - PPBS AT	8.46667	25.73732	6.64535	1.274	14	.223

Since p value < 0.05, the level of significance for TLC & ESR; there is strong evidence to reject the null hypothesis for both factor stated above.

**Table No 17 Group B:**

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	TLC BT - TLC AT	1866.66667	990.43040	255.72803	7.299	14	.000
Pair 2	ESR BT - ESR AT	1.13333	.99043	.25573	4.432	14	.001

Pair 3	Blood calcium BT -Blood calcium AT	-.04000	.06325	.01633	-2.449	14	.028
Pair 4	FBS BT - FBS AT	.33333	2.96808	.76636	.435	14	.670
Pair 5	PPBS BT - PPBS AT	2.46667	3.71996	.96049	2.568	14	.022

Since p value < 0.05, the level of significance for factors TLC, ESR, Blood Calcium & PPBS; there is strong evidence to reject the null hypothesis for the factors stated above.

**Table No 18:** Group 'A':The test used is Wilcoxon Signed Rank test.

Test Statistics <sup>1</sup>					
	Pain AT - Pain BT	Stiffness AT - Stiffness BT	Tenderness AT - Tenderness BT	Coin test AT - Coin test BT	Restriction in movement of <i>kati</i> AT - Restriction in movement of <i>kati</i> BT
Z	-3.520 <sup>b</sup>	-3.397 <sup>b</sup>	-3.493 <sup>b</sup>	-3.520 <sup>b</sup>	-3.448 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000	.001	.000	.000	.001
a. Wilcoxon Signed Ranks Test					
b. Based on positive ranks.					

**Table No 19:** Group 'B':

Test Statistics					
	Pain AT - Pain BT	Stiffness AT - Stiffness BT	Tenderness AT - Tenderness BT	Coin test AT - Coin test BT	Restriction in movement of <i>kati</i> AT - Restriction in movement of <i>kati</i> BT
Z	-3.508 <sup>b</sup>	-3.508 <sup>b</sup>	-3.493 <sup>b</sup>	-3.508 <sup>b</sup>	-3.520 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000
a. Wilcoxon Signed Ranks Test					
b. Based on positive ranks.					

Since p value < 0.05, the level of significance for all factors & for both the groups; there is strong evidence to reject the null hypothesis for all factors & for both the groups.

## DISCUSSION

a) **Discussion on Katigraha:** Vata is having two functions, one is to recognize and other is to stimulate all the activities in the body. Due to its *chalaguna* it moves all over the body. By virtue of this property Vata has the nature of moving to different parts of the body, localize there and produce diseases pertaining to that structure. *Katigraha* is a condition in which the vitiated *vata* is localizing in the *katiprade-*

*sha* and producing pain and stiffness there. *Kati* is an area where there is union of various *Sandhis*, *Snaayu* and *Peshis*. There are different structures which help in maintaining the stability of joints. *Snayu* or ligament is those structure which helps in proper binding of the joint. They unite the bones and help the bone movement and prevent the excessive and undesirable motion, muscle tone helps to maintain the alignment of the joint. *Shleshmadhara*

*kala* helps in lubrication, provides nutrients and helps in keeping the joint firmly united. Therefore the vitiation of *vata* can cause pathologies of these structures in the *katipradesha*.

*Katigarha* is characterized by pain and restricted movement of *katipradesha*. The pathology of *Katigraha* can be explained in two ways, *Dhatukshaya* and *Avarana*. In *Dhatukshaya* *Janaya* *Katigraha* due to old age and *vatakara* *aharavihara* there will be qualitative changes in joint material gradually leading to disease manifestation. The other way of *Samprapti* where is due to continuous pressure due to various factor like accumulated mala the joint may get affected (due to *Avarana*) leading to disease manifestation.

As we know because of our lifestyle like more sedentary habits there will be stress on our body and not only the physical stress but also mental stress increase day by day. So due to this stress our bones also affected. Due to continuous irritation on spine by continuous sitting or less physical work there will be in inflammatory changes on lumbar region which causes stiffness and pain in that region. As by doing *Bhujangasana* the elasticity of spine increase and stiffness and pain decrease and by neutral water spinal bath the blood circulation to the spine increase and toxins from that area is removed and it also soothes the nervous system and provides relaxation.

b) **Discussion of *Bhujangasana*:** This is the most effective asana to increase the flexibility thereby reduces the stiffness from the lower spine region. *Bhujangasana* helps to loosens up the spine, removes impure blood from the back region and tones up the nerve. In nutshell, it facilitates the effective coordination

between the brain and rest parts of the body thus ensure better health. (figure no. 01)

c) **Neutral water spinal bath:** Natural water spinal bath is a type of Hydrotherapy, which can sooth sore of inflamed muscles and joints, rehabilitate injured limbs, lower fever, sooth headache, promote relaxation, treat burns and frost bite, ease labor pains and clear up skin problems. The temperature of water used affects the therapeutic properties of the treatment. Hot water is chosen for its relaxing properties. It is also stimulate the immune system. Tepid water can also be used for stress reduction and may be particularly relaxing in hot weather. Cold water is selected to reduce inflammation. Alternating hot and cold water can stimulate the circulatory system and improve the immune system. It also helps to supplies fresh nutrient and oxygen to injured tissue and removal of waste products. In injuries alternate applications of heat and cold accelerate healing by improving blood vessel integrity and muscle tone. Heat causes peripheral blood vessels to dilate or expand. Cold causes peripheral blood vessels to constrict and drives blood back to organs.

d) **Discussion on the patients of *Katigraha* who underwent trial**

**Age** –The age group 21-30yr in Group ‘A’ is 26.67% and in Group ‘B’ is 20%, the age group 31-40yr in Group ‘A’ is 66.67% and in Group ‘B’ is 26.67%, the age group 41-50yr in Group ‘A’ is 6.67% and in Group ‘B’ is 53% .This may be due to heavy work on this age.(Table no.1)

***Dehaprakruti*** - In the present study the majority of the patients were *KaphPitta* i.e. in Group ‘A’ 26.67% and in Group ‘B’ is 33.33%, *KaphaVata* in Group ‘A’ is 26.67% and in Group ‘B’ is

20%, *VataPitta* in Group 'A' is 26.67% and in Group 'B' is 20%, *Vatakapha* in Group 'A' is 13.33% and in Group 'B' is 13.33%, *PittaVata* in Group 'A' is 6.67% and in Group 'B' is 6.67%, *PittaKapha* in Group 'A' is None and in Group 'B' is 6.67%. So in Group 'A' *KaphaPitta*, *KhaphaVata* and *VataPittapra-*  
*kruti* patients are more and in Group 'B' *Ka-*  
*phaPittapra*kruti patients are more.(Table no.2)

#### e) Discussion on Results

**Effect of Therapies on TLC** - Patients having TLC value 4000-8000 before treatment for Group 'A' is 20% and Group 'B' is none after treatment for Group 'A' is 40% and Group 'B' is 20%, TLC value 8000-12000 before treatment for Group 'A' is 53.33% and Group 'B' is 66.67% after treatment for Group 'A' is 60 % and Group 'B' is 80% ,TLC value 12000 and above before treatment for Group 'A' is 26.67% and Group 'B' is 33.33% after treatment for Group 'A' is None and Group 'B' is None. (Table no.3)

**Effect of Therapies on ESR** - Patients having ESR value 3-7 before treatment for Group 'A' is 33.33% and Group 'B' is 33.33% after treatment for Group 'A' is 60% and Group 'B' is 46.67%, ESR value 7-11 before treatment for Group 'A' is 46.67% and Group 'B' is 53.33% after treatment for Group 'A' is 33.33 % and Group 'B' is 53.33%, TLC value 11and above before treatment for Group 'A' is 20% and Group 'B' is 13.33% after treatment for Group 'A' is 6.67% and Group 'B' is None. (Table no.4)

**Effect of Therapies on X ray** - Patients having Abnormal X ray before treatment for Group 'A' is 66.67% and Group 'B' is 53.33% after

treatment for Group 'A' is 6.67% and Group 'B' is 13.33%, Normal X ray before treatment for Group 'A' is 33.33% and Group 'B' is 46.67% after treatment for Group 'A' is 93.33 % and Group 'B' is 86.67%. (Table no.5)

**Effect of Therapies on Calcium** - Patients having calcium value 7-8 before treatment for Group 'A' is 26.67% and Group 'B' is 33.33% after treatment for Group 'A' is 26.67% and Group 'B' is 26.67% ,Calcium value 8-9 before treatment for Group 'A' is 53.33% and Group 'B' is 40 % after treatment for Group 'A' is 60 % and Group 'B' is 46.67% ,Calcium value 9 and above before treatment for Group 'A' is 20% and Group 'B' is 26.67% after treatment for Group 'A' is 13.33% and Group 'B' is 26.67%. (Table no.6)

**Effect of Therapies on FBS** - Patients having FBS value 70-90 before treatment for Group 'A' is 46.67% and Group 'B' is 40% after treatment for Group 'A' is 46.67% and Group 'B' is 40%,FBS value 90-110 before treatment for Group 'A' is 40 % and Group 'B' is 53.33 % after treatment for Group 'A' is 46.67 % and Group 'B' is 53.33%, FBS value 110 and above before treatment for Group 'A' is 13.33% and Group 'B' is 6.67% after treatment for Group 'A' is 6.67% and Group 'B' is 6.67%. (Table no.7)

**Effect of Therapies on PPBS** - Patients having PPBS value 115-130 before treatment for Group 'A' is 60 % and Group 'B' is 46% after treatment for Group 'A' is 66.67% and Group 'B' is 73.33%, PPBS value 130-145 before treatment for Group 'A' is 40 % and Group 'B' is 53.33 % after treatment for Group 'A' is 33.33 % and Group 'B' is 26.67%. (Table no.8)



**Effect of Therapies on Pain** - Patients of *Katigraha* treated with *Bhujangasana* had significant relief in pain by 66.66%. Patients of *Katigraha* treated with Neutral Water Spinal Bath along with *Bhujangasana* had got significant relief in pain by 73.68%. The comparison showed that the relief in Group 'B' is better in comparison to Group 'A'. (Table no.9)

**Effect of Therapies on Stiffness** - Patients of *Katigraha* treated with *Bhujangasana* had significant relief in Stiffness by 62.59 %. Patients of *Katigraha* treated with Neutral Water Spinal Bath along with *Bhujangasana* had got significant relief in Stiffness by 82.75%. The comparison showed that the relief in Group 'B' is better in comparison to Group 'A'. (Table no.10)

**Effect of Therapies on Tenderness** - Patients of *Katigraha* treated with *Bhujangasana* had significant relief in Tenderness by 78.12%. Patients of *Katigraha* treated with Neutral Water Spinal Bath along with *Bhujangasana* had got significant relief in Tenderness by 83.33%. The comparison showed that the relief in Group 'B' is better in comparison to Group 'A'. (Table no.11)

**Effect of Therapies on Coin test** - Patients of *Katigraha* treated with *Bhujangasana* had significant improvement in coin test by 77.72%. Patients of *Katigraha* treated with Neutral Water Spinal Bath along with *Bhujangasana* had got significant improvement in coin test by 88%. The comparison showed that the improvement in Group 'B' is better in comparison to Group 'A'. (Table no.12)

**Effect of Therapies on Restriction in movement of kati** - Patients of *Katigraha* treated with *Bhujangasana* had significant relief in Restriction

in movement of *kati* by 62.06%. Patients of *Katigraha* treated with Neutral Water Spinal Bath along with *Bhujangasana* had got significant relief in Restriction in movement of *kati* by 77.77%. The comparison showed that the relief in Group 'B' is better in comparison to Group 'A'. (Table no.13)

**By seeing all the above parameter there is significant improvement in values After Treatment.**

**Comparison of the Effects of Both the Therapies:** It is obvious from the foregoing that Neutral Water Spinal bath along with *Bhujangasana* provided better relief in the criteria like pain, stiffness, tenderness, restriction in movement of *kati*, coin test and provide improvement in X ray, TLC, ESR, FBS, PPBS, having significant result when compare with *Bhujangasana*. Group 'A' provided improvement in all the parameter but the percentage of relief is slight lesser when compared to Group 'B'. It is observed that Group 'B' provided better relief in parameters and is found to be having sustained effect. (Table no. 14-19)

## CONCLUSION

- *Bhujangasana* and Neutral water spinal bath holds promising hopes in the management of *Katigraha* w.s.r to Lumbar Spondylitis.
- The Group 'B' more effective clinically and statistically than Group 'A' in almost all the parameters.

Neutral Water Spinal Bath provides a soothing effect on spinal column and their influence the Central Nervous System and also relieves muscular tension of the vertebral column.

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**Figure no.01**



**BHUJANGASANA**

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