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Effect of positional release technique along with high velocity low amplitude thrust in sacroiliac joint dysfunction

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ABSTRACT

Objective- *The purpose of this topic was to study the effect of positional release technique along with high velocity low amplitude thrust in sacroiliac joint dysfunction.*

Method*: 50 subjects diagnosed with sacroiliac joint dysfunction were included in this study. The age group 21-50 were added in the study. This subjects were allocated by lottery method into 2 groups (group A- hot moist pack, positional release technique and exercises &Group B- hot moist pack, positional release technique, high velocity low amplitude thrust and exercises). Before and after the treatment protocol the subjects were assessed for pain by Short Form Of Mcgill Questioner and Modified Oswestry low back pain questionnaire used for functional mobility. These outcome measures were analysed.*

Result*: Pre and post treatment protocol was analysed by using paired and unpaired t test. Data analysis showed extremely significance for both Short Form of Mcgill Questionnaire (p=0.0001) and Modified Oswestry low back pain questionnaire (p=0.0001).*

Conclusion: *this study concluded that the positional release technique along with high velocity low amplitude thrust and exercises were more effective in decreasing pain and improving quality of life than using positional release therapy and exercises only and thus alternate hypothesis is accepted.*

Keywords: *sacroiliac joints; McGill Pain Scale; spinal adjustments, chiropractics*

I. INTRODUCTION

In 1905, Goldthwaite described the sacroiliac joint pain [1]. In 1934, mixter and barr said that the intervertebral disk can cause low back and leg pain and interest in sacroiliac joint[2]. The sacroiliac joint involved in 15-30% patient who complaints about lower back pain. Quality of life affected in sacroiliac joint dysfunction participants [3]. Approximately 90%of population visit clinics with the complaint of low back pain

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out of which 10-25% of participants experiencing pain at sacroiliac joint. Population of elderly people mostly affected with sacroiliac joint pathologies[4]. Posterior sacral ramus innervates sacroiliac joint and compressed or inflamed.it is source of sacroiliac pain**.** Involvement of sacroiliac joint disorder is most common in adult who lead a sedentary life style and dealing with obesity[5].

Sacroiliac joint dysfunction or sacroiliitis used to describe the inflammation of sacroiliac joint. Pain in joint occurs due to abnormal motion(i.e. Hypomobile or Hypermobile) and malalignment of sacroiliac joint. Hypermobile /hypomobile sacroiliac joint can cause pain in buttocks, groin and in lower limbs. The nature of pain is dull achy, stabbing ,shooting over involved side of limb. And the pain can be extended down in posterior thigh up to knee. Pain can mimic and misdiagnosed as radicular pain. Participants frequently complain of pain while sitting down, lying on ipsilateral site of pain or climbing stairs.

Sacroiliac joint pain occurs due to high energy trauma like falls. It can lead to pelvic ring injury, ligament strain or stress. Even it can be occur due to degenerative arthritis, inflammatory arthropathy ,infections and even moderate impact exercises like lifting ,jogging. Sacroiliac joint is largest axial joint formed by sacrum and ilium of pelvis. This joint is diarthrodial, planar and synovial joints lined by hyaline cartilage. Short and long dorsal sacroiliac ligament, sacrotuberal sacrospinous, iliolumbar, interosseous ligaments are worked on stability of joint. These ligaments connects sacrum and lumbar spine[6].Gluteus maximus ,bicepfemoris and piriformis muscles helps in motion. Alteration in musculature can affects joint mobility and function of sacroiliac joint[7]. Joint motion of sacroiliac joint is limited mainly to rotation around 2^{nd} sacral axis.it has unique motion pattern which is called as nutation and counter- nutation[8].

Sacroiliac joint is synovial joint between sacrum and ilium bone. This joint is immobile. Function of the joint is to transfer weight to lower extremity .Synovial articulation allows joint for minimal rotation and gliding movements.At the level of S1 to S3 symmetrically sacroiliac joint located and it has oblique coronal orientation. Sacroiliac joint experiences most movement during pregnancy[9].

Conventional wisdom has held fast to the notion that the SIJ is immobile. However, studies have demonstrated a screw axis motion of simultaneous sagittal plane rotation and translation[10] . When sacral base moves anteroinferiorly in relation to the ileum it denotes nutation of joint.During counter nutation sacral base moves postero superiorly. These motions mainly occur in lumbosacral extension and flexion movements, respectively. The sacrum is wedge-shaped in rostro caudal as well as ventrodorsally dimensions. This configuration of bone, functions with the sacral ligaments to prevent displacement. As previously mentioned, the many small ridges , depressions present on the articular surfaces which serve to optimize joint stability and They develop in response to stress and vary among each individuals[10]. pelvic ligamentous laxity increase in females with Hormonal changes, resulting hypermobile SIJ seen for the purpose of childbirth. Positional discharge treatment (PRT) is a method of absolute body assessment and treatment utilizing delicate focuses and a place of solace to alleviate the related brokenness. Here delicate point is utilized as a guide just as the situation of solace is kept up for muscle.. When the muscle is at its shortest length ,it becomes the position of minimal discomfort. Passively shortened position is held for 90 seconds and the joint is slowly and passively returned to the neutral position. This position of the muscle causes shortening of both the intrafusal and extrafusal fibers[11]. These changes in fibers result in a significant increase in function range of motion and a decrease in pain

If patient experiences pain over both SIJs and after correcting the joint if that leg appears to be shorter than the uncorrected side.The therapist then treats the uncorrected side in the same manner and the legs will again be of equal length. The less painful side is usually easier to correct first. two or three times each innominate must be rotated posteriorly on the sacrum. Frequently, two or three adjustments are needed to get a complete correction for relief of pain in SIJ Dysfunction.

II. METHODOLOGY

Participants who were referred to physiotherapy department and they were diagnosed by ortho paedician or Physiotherapy department of Krishna Hospital, Karad, As sacroiliac joint dysfunction were selected. Further they were screened clinically and diagnosis was confirmed by special 6 tests of sacroiliac joint dysfunction .which was Distraction test, Compression test, Sacral thrust test, Thigh thrust test, Gaenslen test, Faber's test Considering inclusion and exclusion criteria they were requested to participate in the study. The nature of study and intervention were explained to the participants and those who were willing to participate were included. Before proceeding to intervention a written consent was taken from subject. A brief demographic data including name, age, gender, side affected, Nature of pain as per data collection sheet was recorded. By using random sampling method the participants were divided into two groups each group of 25 participants by chit method; Group A and group B, both groups was received a baseline treatment (Hot moist pack) and exercises (static back, static abdomens, pelvic bridging, hamstring stretch, piriformis stretch).the intervention was given for 3 days a week for1 week. Pain score and functional disability was recorded in the beginning of the treatment session and after 1 week of intervention by by short form of Mc-Gill questionnaire and oswestry low back pain questionnaire respectively.

Group A: Hot moist pack, positional release technique(PRT),Exercises.

Group B: Hot moist pack, positional release technique(PRT), high velocity low amplitude thrust (HVLT),Exercises.

III. RESULT

50 participants were taken and divided into 2 groups, 25 participants in each group. Out of which 56% were females and 44% were males diagnosed with sacroiliac joint dysfunction between age group 21-50 years . One of the literature showed similar finding where females were affected more as compared to males(Rajesh sewani et.al 2015).

In this study, group A had 9 males and 16 females. Group B had 13 males and 12 females. According to unpaired t test, the difference is considered as not significant. The average mean age of participants in Group A was 27.86 ,and in Group B it was 25.86.. According to unpaired t test, the difference is considered as not

significant (p=0.5938). A pre-treatment outcome measure using modified Oswestry low back pain questionnaire and short form of McGill pain questionnaire Score were done.

Here Intra Group correlation (inside Group) was examined factually utilizing Paired t test, entomb Group examination (between Group) was broke down measurably by utilizing Unpaired t test.

Intra Group comparison was analysed statistically using Paired t test for modified Oswestry low back pain questionnaire and short form of McGill pain questionnaire For modified Oswestry low back pain questionnaire , For intra group comparison(within group) shows that there was extremely significant difference in Group A (P<0.0001) and Group B (P<0.0001).(Table 1)

For Inter Group comparison (between Groups) ,This shows that pre-treatment there was no significant difference seen with P values of 0.9541 While on looking at the post treatment esteems, the outcomes between the two Groups utilizing unpaired test uncovered that there was amazingly critical distinction seen with the P esteem 0.0005.(table 2)

For short form of McGill pain questionnaire , for intra group comparison it shows that there was no statistically difference seen with Group A (P= <0.0001) and Group B (P<0.0001) within all three components of the short form of McGill pain questionnaire (table 3,4,5). likewise for Inter Group comparison (between Groups) pre-treatment there was no statistically significant difference seen with P values of 0.9541 ,0.1885, 0.6780 respectively for MPQ,VAS and PPI.(table 6,7,8) While on comparing the post treatment values, the results between the two Groups using unpaired 't' test revealed that there was extremely significant difference seen with the P= <0.001 for MPQ,VAS and PPI.

1. Modified Oswestry low back pain questionnaire **:**

	Pre test	Post test	P Value	T Value	
	Mean ± SD	Mean ± SD			
Group A	44.36±10.029	25.88±6.76	<0.0001	18.95	EXTRMELY SIGNIFICANT
Group B	50.8±16.46	17±9.79	<0.0001	14.59	EXTRMELY SIGNIFICANT

Table no .1 :Comparison of pre and post MOLBPD within the groups

	PRE TEST	POST TEST
GROUP A	44.36±10.02	25.88±6.76
GROUP B	50.8±16.46	17±9.794

P- VALUE	0.1013	0.0005
T- VALUE	1.671	3.731
INTERFERENCE	NOT SIGNIFICANT	EXTRMELY SIGNIFICANT

Table no.2 :Comparison of pre-pre and post-post ModifiedOswestry low back pain questionnaire between groups.

2. SHORT FPRM OF Mcgill Questionnaire

	Pre test	Post test	P Value	T Value	
	Mean ± SD	Mean ± SD			
Group A	27±6.178	13.6±4.682	<0.0001	17.960	EXTRMELY SIGNIFICANT
Group B	27.12±8.338	6.84±3.448	<0.0001	15.367	EXTRMELY SIGNIFICANT

Table no.3: Comparison of pre and post Short Form Of Mcgill Questioner values Within the groups

	Pre test	Post test	P Value	T Value	
	Mean ± SD	Mean ± SD			
Group A	6.256±0.7943	3.228±0.6288	<0.0001	26.608	EXTRMELY SIGNIFICANT
Group B	6.668±1.324	2.108±0.9937	<0.0001	21.456	EXTRMELY SIGNIFICANT

Table no.4: Comparison of pre and post visual analogue scale values Within the groups

	Pre test	Post test	P Value	T Value	
	Mean ± SD	Mean ± SD			

Group A	3.68±0.6272	1.32±0.4761	<0.0001	24.087	EXTRMELY SIGNIFICANT
Group B	3.76±0.7234	0.76±0.4359	<0.0001	19.640	EXTRMELY SIGNIFICANT

Table no.5: Comparison of pre and post present pain intensity values within the groups

	PRE TEST	POST TEST
GROUP A	27 ± 6.178	13.6± 4.682
GROUP B	27.12 ± 8.338	6.84 ± 3.448
P VALUE	0.9541	<0.0001
T VALUE	0.0578	5.813
INTERFERENCE	NOT SIGNIFICANT	EXTREMELY SIGNIFICANT

Table no.6: Comparison of pre-pre and post-post values of Short Form Of McGill Questionnaire between the groups

	PRE TEST	POST TEST
GROUP A	6.256 ± 0.7943	3.228± 0.6288
GROUP B	6.668 ± 1.324	2.108 ±0.9937
P VALUE	0.1885	<0.0001
T VALUE	1.334	4.762
INTERFERENCE	NOT SIGNIFICANT	EXTREMELY SIGNIFICANT

Table no.7: Comparison of pre-pre and post-post values of visual analogue scalebetween the groups.

	PRE TEST	POST TEST

GROUP A	3.68 ± 0.627	3. ±0.7234
GROUP B	1.32 ± 0.4761	0.76 ±0.4359
P VALUE	0.6780	<0.0001
T VALUE	0.417	4.338
INTERFERENCE	NOT SIGNIFICANT	EXTREMELY SIGNIFICANT

Table no.8: Comparison of pre-pre and post-post values of present pain intensity between the groups.

IV. DISCUSSION

The given treatments were significantly effective but Group B showed considerable improvement as compared to Group A. One of the literature said that the Moist heat can penetrate more quickly than dry heat the reason behind that the water molecules conduct heat better than air molecules, so the moist heat can be used at lower temperatures and with shorter exposure periods than dry heat[12]. Hot moist packs increase metabolic activity of tissue by increasing blood flow and removing metabolic waste products. Also, application of heat stimulates the neural receptors in the skin and tissues which causes reduction in muscle spasm even hot moist pack is useful in alleviating sacroiliac joint dysfunction in terms of pain, increase in lumbar ROM, and reduce disability[13].

positional release techniques shows analgesic effect which attributed to the relaxation of the damaged tissues which achieved by placingparticipants in comfortable position of ease that enhance the removal of sensitizing inflammatory mediators. The instrument behind this strategy is that the shortening of the muscle imparts a sign to the mind making the muscle compression be decreased. This strategy is utilized for alleviation of physical dysfunctions that are excessively intense or too fragile to even consider treating with different strategies [14]. Reduction in pain due to PRT supported by Meseguer et al. (2006)[15] author said the application of PRT may be effective in producing hypoalgesia and decreased the reactivity of tender points in the upper trapezius with neck pain participants. Even they reported moderate effect sizes for the visual Analogue scale for pain intensity between pre and post intervention measurement following the application of PRT.

Lewis and Flynn (2001) [16] agree with Improvement in functional disability. findings which they attributed to**;** a) circulatory changes, neurological changes, which occur when a distressed area is placed in its easy, most comfortable and most pain-free position, hence it can use as an effective treatment technique in mechanical low back pain participants. b) automatically resetting of muscle spindles[17]·When agonist muscle shaft movement is reset, opponent muscle axle action can likewise come back to the resting state assuaging distorted neuromuscular action and reestablishing ordinary capacity [18]. even they reported that there was an improvement in disability levels which is measured by Oswestry low back pain disability questionnaire and pain severity measured by McGill pain questionnaire in all participants with low back pain.

one of the study which is done by French et al.,have little evidence on the effect of short-term thermotherapy on acute and subacute low back pain. In their study, exercise was more effective on pain relief and functional improvement [19].

V. CONCLUSION

Various conservative approaches are used in treating sacroiliac joint dysfunction but this study concluded that the positional release technique along with high velocity low amplitude thrust and exercises were more effective in decreasing pain and improving quality of life than using positional release therapy and exercises only and thus alternate hypothesis is accepted. That there is significant effect of combination of positional release technique and high velocity low amplitude thrust accepted

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