

Effectiveness of Positional Release Technique (PRT) as an adjunct to Conventional Occupational Therapy Treatment in Upper Trapezitis.

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ABSTRACT

Trapezitis is inflammation of trapezius muscle. As trapezius is one of the postural muscles of neck, it gets highly susceptible to overuse. People working on computers or desks for longer time with low chair seat, people elevating shoulder to hold phone for long telephone conversations, carrying heavy school or college bag causes shortening of trapezius muscle and leads to severe neck spasm and stiffness around shoulder and upper back. Positional release technique (PRT) is a soft tissue manual therapy technique used for relieving muscle pain and spasm. No study was found which includes PRT as an adjunct to OT in upper Trapezitis in Indian population. So the purpose of the study is to find effectiveness of PRT as an adjunct to OT treatment in upper trapezitis.

OBJECTIVES

- 1) To study the effectiveness of PRT as an adjunct to Conventional Occupational Therapy in upper trapezitis.
- 2) To study effectiveness of Conventional Occupational Therapy alone in upper trapezitis.
- 3) To compare the effectiveness of PRT as an adjunct to Conventional Occupational Therapy and effectiveness of Conventional Occupational Therapy alone in upper trapezitis.

STUDY DESIGN

Prospective, comparative, interventional study.

METHODS

A total of 55 subjects both male and female participants aged between 18-40 years diagnosed with upper trapezitis were recruited in the study. 25 subjects were in each group. They were randomly divided into two groups using computerized generated table. Group A patients received conventional occupational therapy treatment alone and Group B received positional

release technique as an adjunct to conventional occupational therapy treatment for a period of 2 weeks (weekly thrice). All the participants were evaluated for pain using VAS and patient performance in activities of daily living and functional activities using NDI. Assessment was done at first day and at the end of second week (6th session).

RESULTS

The p-value less than 0.05 was taken as statistically significant. The results from Wilcoxon signed rank test indicated statistically significant reduction in pain and improvement in patient performance in activities of daily living and functional activities within both the groups from baseline to end of 2nd week. Both the treatments were found to be equally effective using t-test. Although statistically significant difference was seen within both the groups, there was equal statistically significant changes seen in between the treatment of both the groups using Mann Whitney U test.

CONCLUSION

Group who received Positional Release Technique (PRT) as an adjunct to Conventional occupational therapy had better results than group who received only conventional occupational therapy though not statistically significant. After analyzing the data and comparing it with existing literature, we can conclude that using conventional occupational therapy alone and conventional occupational therapy with PRT together, both had equal effect in patients with upper trapezitis.

PRT can be used along with conventional occupational therapy for more effective results.

KEYWORDS

Positional Release Technique, Conventional Occupational Therapy, Trapezitis.

INTRODUCTION

Trapezitis is a inflammation of trapezius muscle.¹ Trapezius is upper back postural muscle which has its origin from medial one third of superior nuchal line, external occipital protuberance, C7 spine. It is supplied by spinal part of accessory nerve. Upper fibers elevates the scapula, middle fibers retracts the scapula and lower fibers steadies the scapula.³

In day to day life, upper trapezitis is commonest condition found among male and female from school going children to geriatric population in India irrespective of occupation (any

sedentary or physical work). As trapezius is one of the postural muscles of neck, it gets highly susceptible to overuse. The ratio of prevalence in males and females in India is 1:10 and 3-5% of population is affected worldwide.⁴ People working on computers or desks for longer time with low chair seat, long distance driving of vehicles, people elevating shoulder to hold phone for long telephone conversations, carrying heavy school or college bag, or even the use of thick pillow while sleeping causes shortening of trapezius muscle and leads to severe neck spasm and stiffness around shoulder and upper back.^{5,6} Other symptoms include aching shoulder, a feeling of neck hurting, headache or pain behind the ears.⁷

The pain of upper trapezitis can be felt more during extension of neck as looking upwards or in neck rotation as looking sideways. Passive neck ranges may be painful and restricted as a result of pain and protective spasm and tightness in antagonist groups of neck muscles.¹

Trapezius muscle get shortened due to spasm and if it remains untreated, it may lead to formation of knots called Myofascial Trigger points.(MTrps)⁸

Functional difficulties faced due to upper trapezitis are difficulty in overhead activities like reaching overhead cupboard, dressing, self-grooming etc. Visual field gets compromised due to restricted neck movements.

Trapezitis is commonly treated with conservative management. Conservative management include analgesics, muscle relaxants, myofascial release technique, stretching and different modalities like cryotherapy, transcutaneous electrical stimulation, heat, exercise therapy in addition to techniques like positional release technique.⁵

Myofascial release is a safe, low load stretch that releases tightness and the pain. Symptoms may aggravate in any condition treated with myofascial release technique in acute stage. It is generally used in chronic stages.⁹

Cryotherapy is use of ice packs, vapo-coolant spray, ice massage and cold whirlpool. It causes vasoconstriction, reduces tissue metabolism and results in decrease in inflammation, spasm and pain.⁸ It may cause frostbite if taken for longer period and may cause permanent skin damage.

TENS is a noninvasive electrical modality which either works on pain gate mechanism or the opioid system.¹⁰ Electrodes need to be placed at proper place for accepted results.

Positional release technique (PRT) is a soft tissue manual therapy technique which is also called as strain counter strain used for relieving muscle pain and spasm.¹ The aim of PRT is

to remove restrictive barriers of movement in body.¹² Trigger points (TrPs) which causes spontaneous pain when evoked by an external stimulant is called as latent trigger points.¹¹ These trigger points are identified and pressure is applied until nociceptive response is produced. Also the area is positioned passively in such a way that muscle is shorten which results in resetting of muscle tone and improves circulation.¹ All 3 planes of movement are used to attain the position of greatest comfort.¹³ In this study, PRT was given in supine position as it was more comfortable for the patient and positioning of upper limb is easy.

Positional release technique (PRT) is a soft tissue manual therapy technique which is also called as strain counter strain used for relieving muscle pain and spasm.¹ The aim of PRT is to remove restrictive barriers of movement in body.¹¹ In this study, PRT was given in supine position as it was more comfortable for the patient and positioning of upper limb was easy.

Exercises helps to strengthen the muscle around neck, increase range of motion and improves mobility which helps in decreasing the recurrence of trapezitis. Toxins responsible for inflammation are removed by isometric exercises which involves contraction and relaxation of neck muscles.⁴

Population based surveys in India has shown lifetime prevalence of neck pain between 67% to 87%. No study was found which includes PRT as an adjunct to OT in upper Trapezitis. So the purpose of the study is to find effectiveness of PRT as an adjunct to OT treatment in upper trapezitis.

METHOD

It is prospective, comparative, interventional study for a period of 18 months. 55 patients with upper trapezitis was taken in the study. Sampling was done according to simple random sampling. All the patients diagnosed as upper trapezitis that came on OPD basis during the study period and who met inclusion criteria were included in the study. There were 5 drop outs from the study. Hence, 50 patients were studied, 25 in each group. Demographics like Age, Gender, Address, Present medical history, past medical history relevant to present condition, Dominance, Occupational and Social history of the subjects will be recorded.

Clinical Orthopedic Evaluation

- All the subjects were assessed for:

1) Pain by Visual Analogue Scale (VAS)

2) Neck Disability Index

The clinical evaluations were performed on the 1st day (baseline) and on last day (6th session) i.e. at the end of 2nd week. Evaluation done including recording of pain on visual analogue scale and neck disability index scale for recording participant's difficulty in ADL and functional activities. Protocol was for 2 consecutive weeks every alternate day i.e. total 6 sessions (weekly thrice). Group A was treated with conventional occupational therapy treatment alone and Group B received positional release technique as an adjunct to conventional occupational therapy treatment.

Conventional occupational therapy program for Group A and B includes

Shoulder girdle exercises including scapular protraction, retraction, elevation and depression. Active Neck exercises including cervical flexion, extension, right and left rotation and side flexion. All exercises were given for 10 repetitions and 5 seconds hold in front of mirror. All these exercises are performed by the patients under supervision of therapist.

These exercises increases ROM, improve neck mobility and strengthen the neck muscle and thus help in reducing recurrence of trapezitis⁴.

Positional Release Technique for Group B

As for PRT prior to starting the treatment, the therapist identified the Latent trigger points (LTrPs) in the upper trapezius muscle using one or two finger pads. It was marked with a small dot on the skin at each treatment. The subject was laid in supine position with cervical spine in neutral position. Subjects were encouraged to relax as much as possible. The therapist applies gradually increasing pressure by her thumb over the TrPs of upper trapezius muscle until the sensation of pressure became one of pressure and pain. At the same time, the therapist created a new position with less tension result in a subjective reduction of pain upto 70%. The position that led to reduced pain was cervical extension, ipsilateral side flexion of cervical spine with contralateral rotation (5-8⁰). The patient's upper extremity was positioned in passive abduction and maintained for 90seconds. Hold the position until fasciculation decreases or ceases. Finally, the subject was slowly placed into neutral position of cervical spine. This technique was performed 3 times in each treatment session with 15 seconds rest interval. Dominant trigger point is treated first and 3-4 additional TPs for one session. The application of PRT is safe and effective method to successfully treat elicited TrPs.

Ergonomics considerations were explained to the patients.

Monitor height of computer should be at eye level. If it is too high, extension of neck for long period of time causes problem. Chair armrest should be of appropriate height so that elbow

should be supported at 90⁰ and forearm should be rested on it. The mouse position was adjusted to prevent forward arm position and protraction of the shoulder. Person should seat with back supported while watching T.V. Heavy weight should not be carried on only one side. While sleeping, thin pillow should be kept to support head, neck and shoulder.

RESULTS

This study was conducted on 55 patients of age 18-40 years for a period of 2 weeks. The patients were randomly assigned into two groups using computerized generated table.

Group A patients received conventional occupational therapy and Group B patients received PRT as an adjunct to conventional occupational therapy treatment.

Statistical Analysis

The data was entered using MS-Excel and analyzed using SPSS-16 software. Following statistical tests of significance were used.

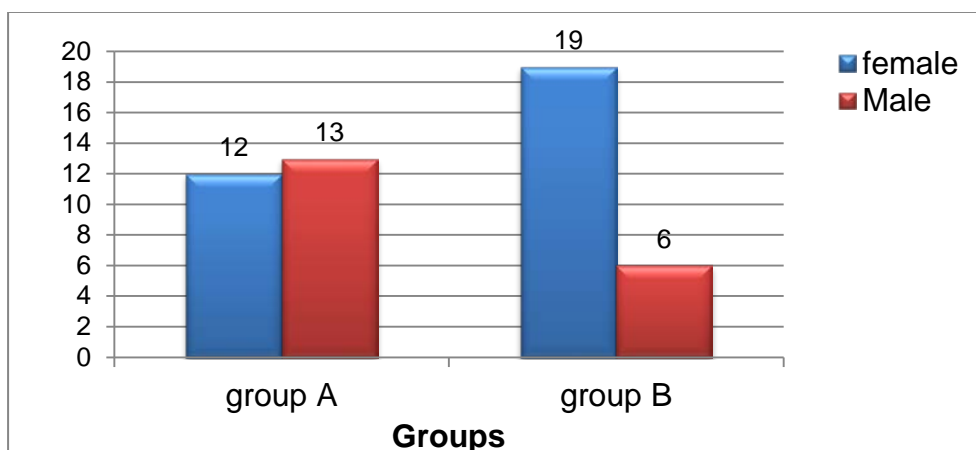
1. Wilcoxon signed rank test is a non-parametric statistical hypothesis test which is used to compare results of pre and post intervention within the same group.
2. Mann- Whitney test is used to compare results in between group A and group B.
3. T-test is used is used to compare means of two groups.

TABLE 1: GENDER DISTRIBUTION IN GROUPS

			Group		Total
			Group A	Group B	
Sex	F	Count	12	19	31
		% within Group	48.0%	76.0%	62.0%
	M	Count	13	6	19
		% within Group	52.0%	24.0%	38.0%
Total		Count	25	25	50
		% within Group	100.0%	100.0%	100.0%

Table 1) shows that out of 25 subjects in Group A, 12 subjects were females and 13 were males. Similarly, out of 25 subjects in Group B, 19 subjects were females and 6 were males. Total number of females and males who participated in study was 31 and 19 respectively.

GRAPH 1: GENDER DISTRIBUTION IN GROUPS



Graph 2 indicates number of participants in each group. X-axis represents group A & B whereas Y-axis represents number of participants. 12 females and 13 males are in Group A and 19 female and 6 males are in group B.

TABLE 2: OCCUPATION AMONG SUBJECTS IN GROUP A AND B

			Group		Total
			Group A	Group B	
Occupation	Clerk / computer operator	Count	8	4	12
		% within Group	32.0%	16.0%	24.0%
	Housewife	Count	7	10	17
		% within Group	28.0%	40.0%	34.0%
	Doctor / Therapist	Count	3	7	10
		% within Group	12.0%	28.0%	40.0%
	Tailor	Count	4	3	7
		% within Group	16.0%	12.0%	14.0%
	Worker/ Assistant at shop	Count	3	1	4
		% within Group	12.0%	4.0%	8.0%
Total		Count	25	25	50
		% within Group	100.0%	100.0%	100.0%

Table 2) shows that out of total subjects, in Group A - 8 subjects are clerk / computer operator, 7 are housewives, 3 are Doctor/ Therapist, 4 are Tailor, 3 are Worker / Assistant at shop. In Group B – 4 are clerk / computer operator, 10 are housewives, 7are Doctors / Therapists, 3 are Tailors, 1 is Worker / Assistant at shop.

GRAPH 2: OCCUPATION AMONG SUBJECTS IN GROUP A AND B

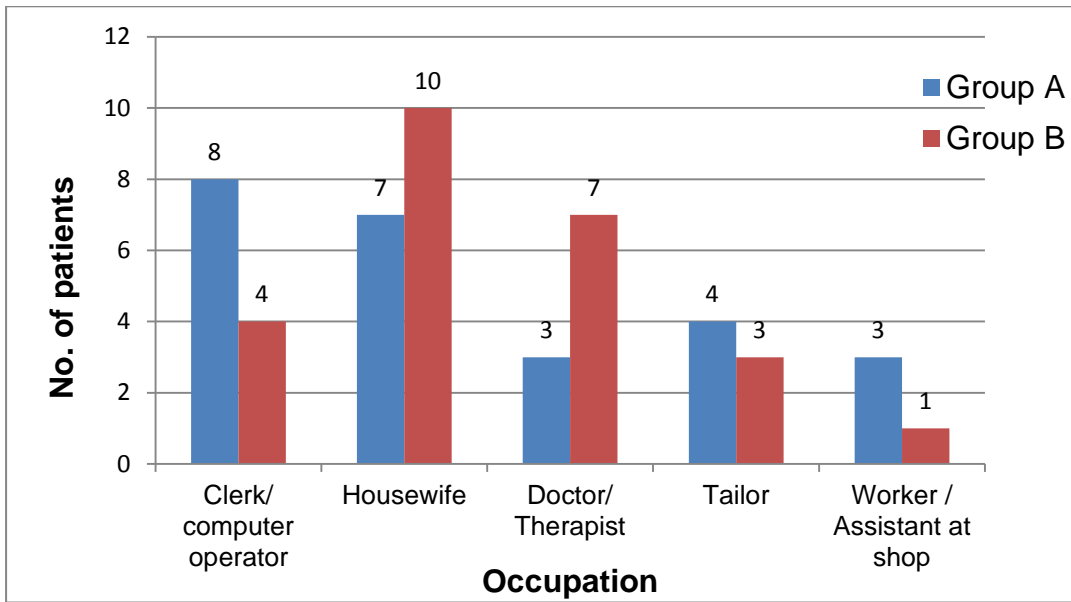
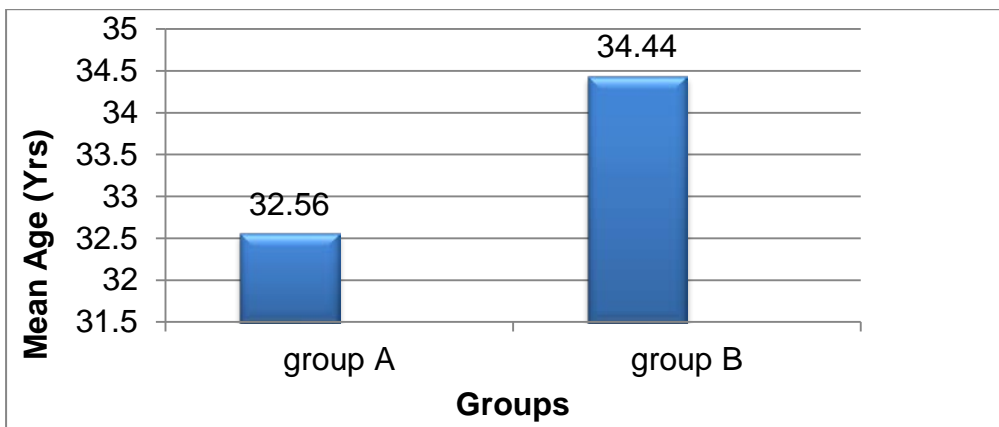


TABLE 3: AGE DISTRIBUTION

Group Statistics					
Age	Group	N	Mean	Std. Deviation	Std. Error Mean
	Group A	25	32.5600	5.79569	1.15914
	Group B	25	34.4400	5.50061	1.10012

Table 3) shows age distribution in population of Group A and Group B. The mean age of Group A subjects is 32.56 years and that of Group B is 34.44 years.

Graph 3: AGE DISTRIBUTION



Graph 3) indicates mean age in both the groups. In group A mean age is 32.56 years and in group B mean age is 34.44 years.

Table 4 A: COMPARISON OF MEAN RANKS OF PRE AND POST PAIN (VAS) SCORE IN GROUP A

Group A	N	Mean Rank	p-value	Significant / Not significant
Post VAS - Pre VAS				
Negative Ranks	25	13.00	.000	Significant
Positive Ranks	0	.00		
Ties	0			
Total	25			

Table 4 A) shows significant improvement in pain scores according to Visual Analogue Scale in groups A from pre intervention i.e. 1st day (baseline) to post intervention (6th session) (p-value < 0.05).

Table 4 B: COMPARISON OF MEAN RANKS OF PRE AND POST PAIN (VAS) SCORE IN GROUP B

Group B	N	Mean Rank	p-value	Significant / Not significant
Post VAS - Pre VAS				
Negative Ranks	25	13.00	.000	Significant
Positive Ranks	0	.00		
Ties	0			
Total	25			

Table 4B) shows significant improvement in pain scores according to Visual Analogue Scale in groups B in between pre intervention day 1 (baseline) to post intervention day 6 (6th session) (p-value < 0.05).

Table 4C: COMPARISON OF MEDIANS OF PAIN (VAS) SCORE

Measure	Factor	N	Median		Mean Rank		Mann-Whitney	Z value	p-value	Significant/ Not significant
			Group A	Group B	Group A	Group B				
Pain (VAS Score)	Pre	25	8	1	25.64	25.36	309.000	-.069	.945	Not significant
	Post	25	8	2	22.44	28.56	236.000	-1.554	.120	Not significant

Table 4C indicates that there is no significant comparative improvement in pain score in between group A and B in between pre intervention day 1(baseline) to post intervention day 6(6th session) since P value is < 0.05

Graph 4: COMPARISON OF MEDIANS OF PAIN (VAS SCORE)

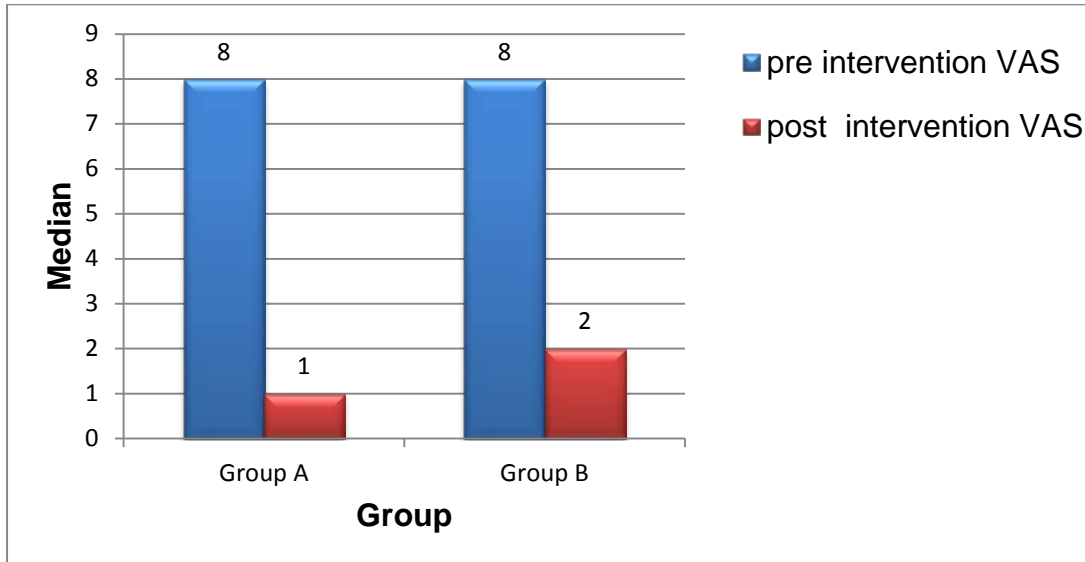


Table 5 A): COMPARISON OF MEAN RANKS OF PRE AND POST NDI SCORE IN GROUP A

Group A	N	Mean Rank	p-value	Significant / Not significant
Neck Disability Index Post - Neck Disability Index Pre	25	13.00	.000	Significant
Negative Ranks	0	.00		
Positive Ranks	0			
Ties	0			
Total	25			

Table 5 A) shows significant improvement in activities of daily living and functional activities according to Neck Disability Index in groups A from pre intervention day 1(baseline) to post intervention day 6 (6th session) (p- value < 0.05).

Table 5 B: COMPARISON OF MEAN RANKS OF PRE AND POST NDI SCORE IN GROUP B

Group B	N	Mean Rank	p-value	Significant / Not significant
Neck Disability Index	25	13.00	.000	Significant
Post - Neck Disability Index	0	.00		
Negative Ranks	0			
Positive Ranks	0			
Ties	0			
Total	25			

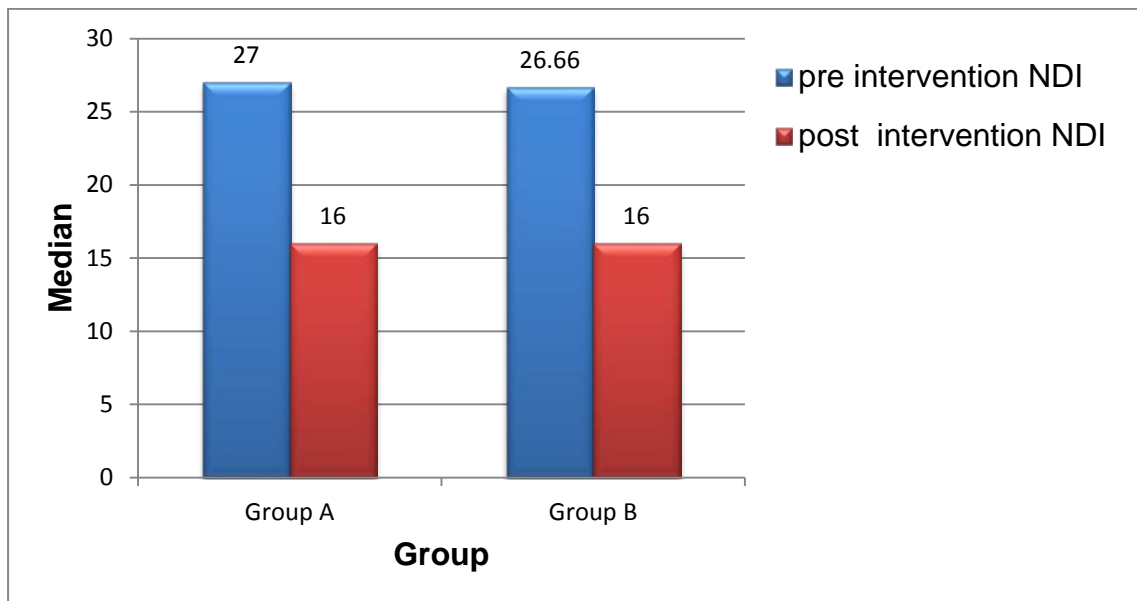
Table 5 B) shows significant improvement in activities of daily living and functional activities according to Neck Disability Index in groups B from pre intervention day 1(baseline) to post intervention day 6 (6th session) (p- value < 0.05).

Table 5C: COMPARISON OF MEDIANS OF NDI SCORE

Measure	Factor	N	Median		Mean Rank		Mann-Whitney	Z value	p-value	Significant/ Not significant
			Group A	Group B	Group A	Group B				
NDI score	Pre	25	27.00	16.00	24.52	26.48	288.000	-.476	.643	Not significant
	Post	25	26.00	16.00	23.84	27.16	271.000	-.820	.412	Not significant

Table 5C indicates that there is no significant comparative improvement in activities of daily living in between group A and B in between pre intervention day 1(baseline) to post intervention day 6 (6th session) since p- value is < 0.05.

Graph 5: COMPARISON OF MEDIANS OF NDI SCORE



DISCUSSION

The objective of this study was to compare the outcome of conventional occupational therapy and positional release technique as an adjunct to conventional occupational therapy in upper trapezitis.

The data obtained and the outcome measures enabled us to analyze changes in the level of pain and patient performance in activities of daily living and functional activities.

In the present study, age group participated was between 18 years to 40 years. In this study, total 55 participants were recruited and 5 discontinued the therapy (The probable reasons for drop outs might be difficulty to travel to the institution, quick relief from pain killers, worsening of symptoms or not able to adjust their schedule to attend the therapy).

Table 1) shows that there are total 31 females and 19 males included in the study which showed that females are more prone to get trapezitis.

Table 2) shows that out of total subjects, in Group A - 8 subjects are clerk / computer operator, 7 are housewives, 3 are Doctor/ Therapist, 4 are Tailor, 3 are Worker / Assistant at shop. In Group B - 4 are clerk / computer operator, 10 are housewives, 7 are Doctors / Therapists, 3 are Tailors, 1 is Worker / Assistant at shop.

This study have recruited patients with trapezitis. Out of which 17 were housewives 12 clerk / computer operator,10 Doctor/ Therapist,7 tailors and 4 were Worker / Assistant at shop.

So from this data it can be hypothesized that housewives are more prone to get trapezitis because of keeping neck in sustained stressful position for longer period of time during various household chores like cooking ,washing clothes, taking children`s study, ironing etc.

Clerk/computer operator were having trapezitis as they used to keep neck in sustained static position while doing table top activities as working on computers/laptops, typing, writing etc.

Females whose occupations were housewives/clerk/doctors are more prone to get affected. (Varun Naik 2015).

Doctors/Therapist who were working for longer time showed trapezitis.

Tailors and worker/ assistants were least in numbers.

Trapezitis is seen in these occupations more because of as lack in knowledge of ergonomics, neck care while working in sustained static position of neck. This creates higher impact of stress on prime muscles like trapezius responsible for maintainance of kinetics and kinematics of neck and ultimately participates in normal functions of daily life. (A. kumaresan G. Deepthi Vaiyapuri Anandh S. Prathap, 2012). Gauresh.(2014).

Pain which is an important factor following any kind of changes in musculoskeletal tissues was assessed by using Visual Analogue scale. The mean rank VAS score from pre intervention day 1 (baseline) to post intervention day 6 (6th session) was 13.00 for both group A and B (Table 4A and 4B). Both tables and graph no.1 showed that there is significant reduction in pain within the groups ($p < 0.05$).

Table 4C shows medians of VAS score from pre intervention day 1 (baseline) to post intervention day 6 (6th session) which were found to be 8 for group A and 1 and 2 for group B respectively. This table also emphasized that there is no statistically significant reduction in pain in between two groups (p -value = 0.945, 0.120 respectively).

Although both groups showed significant reduction in pain median values did not show significant changes comparatively.

It was found that PRT with conventional Occupational Therapy and only conventional occupational therapy inclusive of neck and scapular exercises along with ergonomics are equally effective in pain alleviation.(Jagatheesan Alagesan and Unnati S. Shah 2016)

Neck disability index was used to assess limitations in patient performance in activities of daily living and functional activities. The mean rank NDI score was 13.00 for both groups and there was significant reduction in level of difficulties within the groups ($p < 0.05$) (Table 5A and 5B).

Table 5 A) shows significant improvement in activities of daily living and functional activities according to Neck Disability Index in groups A from pre intervention day 1(baseline) to post intervention day 6 (6th session) (p - value < 0.05).

Table 5 B) shows significant improvement in activities of daily living and functional activities according to Neck Disability Index in groups B from pre intervention day 1(baseline) to post intervention day 6 (6th session) (p - value < 0.05).

Table 5 C) shows medians of NDI score from pre intervention day 1 (baseline) to post intervention day 6 (6th session) which were found to be 13 for group A and group B respectively. This table also emphasized that there is no statistically significant changes seen in activities of daily living and functional activities in between two groups (p -value = 0.643 and 0.412 respectively).

Although both groups shows significant reduction in neck disability (graph 5), median values does not show significant changes comparatively.

Overall results shows equal effectiveness of PRT and conventional Occupational Therapy on pain management and improvement in quality of patient performance in activities of daily living and functional activities on comparing results of both the groups.

It was observed that PRT is less time consuming (approximately 90 seconds per MTrP) in the treatment of and as it is manual therapy patient has a choice of selection of intervention technique over use of other physical modalities anxiety.

It was also observed that PRT is a manual intervention technique which is quick and easy to apply as well as has minimum or no risk factors.

Thus from above results we can conclude that positional release technique as an adjunct to conventional occupational therapy and conventional occupational therapy alone are equally effective in reducing pain and improving patient performance in activities of daily living. Hence, we accept our null hypothesis that says “There is no difference in effectiveness of PRT as an adjunct to Conventional Occupational Therapy in upper trapezitis”.

CONCLUSION

Group who received Positional Release Technique (PRT) as an adjunct to Conventional occupational therapy had better results than group who received only conventional occupational therapy though not statistically significant. After analyzing the data and comparing it with existing literature, we can conclude that using conventional occupational therapy alone and conventional occupational therapy with PRT together, both had equal effect in patients with upper trapezitis.

PRT can be used along with conventional occupational therapy for more effective results.

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