Original Article

EFFECT OF COGNITIVE BEHAVIOR THERAPY AS COMPARED TO MYOFASCIAL RELEASE TECHNIQUE IN FIBROMYALGIA SYNDROME

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ABSTRACT

Background and introduction: Fibromyalgia or fibromyalgic syndrome is a common form of non-articular rheumatism characterized by variety of non-specific symptoms including diffuse widespread musculoskeletal aching associated with fatigue, morning stiffness and sleep disturbances (Bennett, 1997). The current study will compare the beneficial effects of Cognitive behavior therapy (CBT) and Myofascial release (MFR) along with conventional treatment. This study tries to find out new effective method for reducing the problems of pain, anxiety and sleep disturbance in fibromyalgia. **Method:** 24 subjects selected according to the inclusion and exclusion criteria were randomly divided in to three groups: Conventional group, Myofascial release along with conventional treatment and Cognitive behavior therapy along with conventional treatment. Pre and post readings at 0 day, 7th day and 14th day were recorded for Fibromyalgia Impact Questionnaire (FIQ), Epworth Sleepiness Scale (ESS) and State Trait Anxiety Inventory (STAI). **Results:** After two week protocol it was found that all three treatment approaches were effective in reducing the problem of pain, anxiety and sleep disturbance to some extent. However on comparing three treatment approaches , CBT is the most effective in reducing the above parameters. ($p<0.05$) **Conclusion:** Cognitive behavior therapy is more effective than Myofascial release tehniques in reducing fibromyalgia symptoms.

KEY WORDS: Fibromyalgia; Fibromyalgic syndrome; Myofascial release; Cognitive behavior therapy; Aerobic exercises.

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INTRODUCTION

Fibromyalgia or fibromyalgic syndrome is a common form of non-articular rheumatism characterized by variety of non-specific symptoms including diffuse widespread musculoskeletal aching associated with fatigue, morning stiffness and sleep disturbances [1], pain and stiffness usually involving the neck, shoulder, and pelvic girdles as well as all of the extremities. Patients may present with pain mainly in one or two regions (i.e. the low back or neck are the most common areas).[2] It is often accompanied by a combination of other signs and symptoms such as irritable bowel syndrome, fluid retention, Raynaud's phenomenon, paresthesias, concentration difficulties/ cognitive impairment, restless leg syndrome, numbness and tingling of the extremities and severe headaches. [3] All these symptoms can have a marked impact on patient's emotional and physical function and activities of daily living.

Pathophysiology of fibromyalgia involves a number of factors, including abnormalities in neuroendocrine and autonomic nervous system, genetic factors, psychosocial variables and environmental stressors.

Fibromyalgia is generally considered to be a stress-related disorder that involve abnormal functioning in the hypothalamic-pituatory-adrenal (HPA) axis , with elevated activity of corticotrophin-releasing hormone (CRH) and substance P. ANS abnormalities may contribute to enhanced pain and other clinical problems associated with fibromyalgia via the alteration of physiologic responses required for effective stress management (e.g. increased in blood pressure) and pain inhibition via diminished production of growth (GH) and insulin-like growth factor (IGF-1). Genetic polymorphisms in the serotoninergic, dopaminergic and catecholaminergic systems of pain transmission and processing are involved in the etiology of fibromyalgia. Environmental triggers that involved in the pathophysiology of fibromyalgia include mechanical/physical trauma or injury and psychosocial stressors.[4]

Management of fibromyalgia syndrome includes both pharmacological and Non-pharmacological interventions. Among them are the use of conventional treatment (hotpack, ultrasound, IFT, aerobic exsercise), Myofascial release and Cognitive behavior therapy. The aim of the study is to find that which among myofascial release and cognitive behavior therapy is more effective in reducing fibromyalgia related parameters as measured on Fibromyalgia Impact Questionnaire (FIQ), Epworth Sleepiness Scale (ESS) and State Trait Anxiety Inventory (STAI).

MATERIAL AND METHODS

The study was performed on 24 subjects within age group 18-65 years taken from the OPD of Sardar Bhagwan Singh Post Graduate Institute of Biomedical Sciences and Research, Balawala, Dehradun, Gurudwara OPD, Patel nagar, Dehradun and Prayas Rehabilitation and Physiotherapy centre, Dehradun, MGH, Balawala, Dehradun. Study was performed in accordance with ethical considerations of the institute and their consent was taken prior to study. The subjects were selected on the basis of random sampling according to inclusion and exclusion criteria and divided in to three groups-conventional, Myofascial release and Cognitive behavior therapy. The inclusion criteria was patients who were diagnosed with fibromyalgia, widespread pain from last 3 months, tender points. Exclusion criteria was patients with severe depression, any skin disease, neurological disorder, unable to attend all treatment.

The subjects were explained about the whole procedure in detail prior to starting the procedure and the pre treatment readings were noted. The subjects in the conventional group were first given hydrocollateral packs followed by IFT and ultrasound, stretchings and isometrics of neck muscles were performed. Subjects in MFR group received apart from treatment given to the conventional group additional myofascial releasetechniques-for pectorals, sternocledo-mastoid, cranio base release, upper trapezius and J stroke. Subjects in the CBT group received apart from the treatment given to the conventional group, MFR group additional cognitive behavior therapy. Post treatment readings were recorded on the 7th and 14th day after the treatment.

RESULTS

Table 1, 2 and 3 compare the mean and SD of pre and post protocol readings of fibromyalgia parameters in each group using paired t-test for FIQ, ESS and STAI y & y2.

Variables	Pre protocol	Post protocol	t-value
FIQ	75.40±8.18	59.80±8.44	19.70
ESS	10.80±2.66	7.10±1.79	5.84
STAI y	51.50±2.88	51.80±3.05	-1.96
STAI y2	48.50±3.78	48.80±3.79	-1.40

Table 1: Mean and SD for FIQ, ESS, STAI y and y2 at 0 day, 14th day for the subjects of Group A.

Variables	Pre protocol	Post protocol	t-value
FIQ	82.40±5.50	54.00±5.62	26.62
ESS	10.10±2.51	4.50±1.27	10.75
STAI y	53.20±3.49	55.20±3.58	-6.00
STAI y2	45.90±3.67	47.50±3.44	-6.00

Table 2: Mean and SD for FIQ, ESS, STAI y and y2 at 0 day, 14th day for the subjects of Group B.

Variables	Pre protocol	Post protocol	t-value
FIQ	88.00±5.35	55.75±8.38	10.00
ESS	10.00±1.63	5.50±1.00	9.00
STAI y	57.75±0.96	50.25±0.50	11.61
STAI y2	51.25±3.30	44.25±2.06	3.70

Table 3: Mean and SD for FIQ, ESS, STAI y and y2 at 0 day, 14th day for the subjects of Group C.

For the conventional group the value for the comparison of mean values of FIQ score on day 0 (75.40±8.18) and on day 14 (59.80±8.44) and t-value is 19.70 which is significant. The mean values of ESS on day 0 (10.80±2.66) and day 14 (7.10±1.79) and t-value is 5.84 which is significant. The mean values of STAI y and y2 score on day 0 (51.50±2.88) and (48.50±3.78) on day 14 (51.80±3.05) and (48.80±3.79) and t-value is -1.96 and -1.40 which is non significant.

For the MFR group the value for the comparison of mean values of FIQ score on day 0 (82.40±5.50) and on day 14 (54.00±5.62) and t-value is 26.62 which is significant. The mean values of ESS on day 0 (10.10±4.50) and on day 14 (4.50±1.27) and t-value is 10.75 which is significant. The mean value of STAI y and y2 score on day 0 (53.20±3.49) and (45.90±3.67) on day 14 (55.20±3.58) and (47.50±3.44) and t-value is -6.00 which is non significant.

For the CBT group the value for the comparison of mean values of FIQ score on day 0 (88.00±5.35) and on day 14 (55.75±8.38) and t-value is 10.00 which is significant. The mean values of ESS on day 0 (10.00±1.63) and day 14 (5.50±1.00) and t-value is 9.00 which is significant. The mean value of STAI y and y2 on day 0 (57.75±0.96) and (51.25±3.30) on day 14 (50.25±0.50) and (44.25±2.06) and t-value is 11.61 and 4.95 which is significant.

FIQ	GROUP A		GROUP B		GROUP C	
	F value	P value	F value	P value	F value	P value
0 day Vs 7th day Vs 14th day	9.782	**P < 0.05**	73.484	**P < 0.05**	28.628	**P < 0.05**

Table 4: Comparison of mean value for FIQ at 0 day, 7th day and 14th day within the Group A, Group B and Group C (ANOVA).

Table 4 shows the comparison of mean value for Fibromyalgia Impact questionnaire (FIQ) at 0 day, 7th day and 14th day within group A, group B and group C. The F-value for group A is 9.78, for group B is 73.48 and for group C is 28.62 and these all are significant.

ESS	GROUP A		GROUP B		GROUP C	
	F value	P value	F value	P value	F value	P value
0 day Vs 7th day Vs 14th day	6.517	**P < 0.05**	21.377	**P < 0.05**	15.511	**P < 0.05**

Table 5: Comparison of mean value for ESS at 0 day, 7th day and 14th day within the Group A, Group B and Group C (ANOVA).

Table 5 shows the comparison of mean value for Epworth Sleepiness Scale (ESS) at 0 day, 7th day and 14th day within group A, group B and group C. The F-value for group A is 6.51, for group B is 21.37 and for group C is 15.51 and these all are significant.

STAI y	GROUP A		GROUP B		GROUP C	
	F value	P value	F value	P value	F value	P value
0 day Vs 7th day Vs 14th day	0.035	P > 0.05	0.785	P > 0.05	61.455	**P < 0.05**

Table 6: Comparison of mean value for STAI y at 0 day, 7th day and 14th day within the Group A, Group B and Group C (ANOVA).

Table 6 shows the comparison of mean value for STAI y at 0 day, 7th day and 14th day within group A, group B and group C. The F-value for group A is 0.03, for group B is 0.78 are non-significant and for group C is 61.45 is significant.

STAI(y2)	GROUP A		GROUP B		GROUP C	
	F value	P value	F value	P value	F value	P value
0 day Vs 7th day Vs 14th day	0.017	P > 0.05	0.521	P > 0.05	6.911	**P < 0.05**

Table 7: Comparison of mean value for STAI (y2) at 0 day, 7th day and 14th day within the Group A, Group B and Group C (ANOVA).

Table 7 shows the comparison of mean value for STAI y2 at 0 day, 7th day and 14th day within group A, group B and group C. The F-value for group A is 0.01, for group B is 0.52 are non-significant and for group C is 6.91 is significant.

FIQ	GROUP A Vs GROUP B Vs GROUP C	
	F value	P value
0 day	5.694	**P < 0.05**
7th day	1.294	P > 0.05
14th day	1.595	P > 0.05
MD (0-14th) day	43.304	**P < 0.05**

Table 8: Comparison of mean value for FIQ at 0 day, 7th day, 14th day and MD (0-14th) day between Group A, Group B and Group C.

Table 8 shows the comparison of mean value for Fibromyalgia Impact Questionnaire at 0 day, 7th day and 14th day and mean difference (0-14th) day between group A, group B and group C. The F-value for 0 day is 5.69 which is significant, for 7th day is 1.29 and for 14th day is 1.59 which are non-significant.

ESS	GROUP A Vs GROUP B Vs GROUP C	
	F value	P value
0 day	0.255	P > 0.05
7th day	2.181	P > 0.05
14th day	7.717	**P < 0.05**
MD (0-14th) day	2.997	P > 0.05

Table 9: Comparison of mean value for ESS at 0 day, 7th day, 14th day and MD (0-14th) day between Group A, Group B and Group C.

Table 9 shows the comparison of mean value for Epworth Sleepiness Scale at 0 day, 7th day and 14th day and mean difference (0-14th) day between group A, group B and group C. The F-value for 0 day is 0.25 which is non-significant, for 7th day is 2.18 which is also non-significant and for 14th day is 7.71 is significant.

STAI y	GROUP A Vs GROUP B Vs GROUP C	
	F value	P value
0 day	6.274	**P < 0.05**
7th day	1.638	P > 0.05
14th day	4.884	**P < 0.05**
MD (0-14th) day	162.018	**P < 0.05**

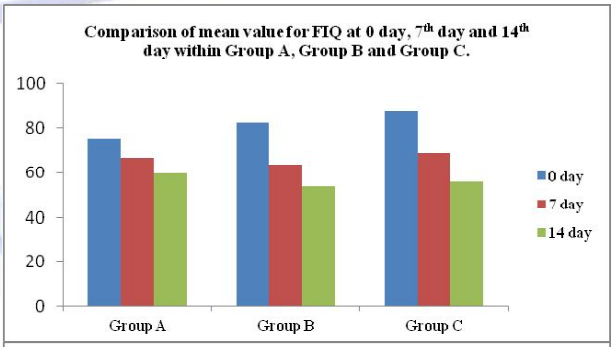
Table 10: Comparison of mean value for STAI y at 0 day, 7th day,14th day and MD (0-14th) day between Group A, Group B and Group C.

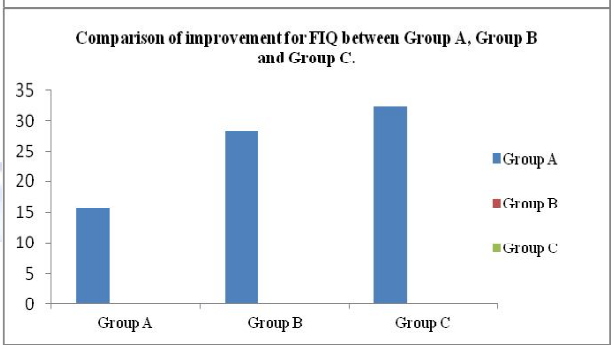
Table 10 shows the comparison of mean value for STAI y at 0 day, 7th day and 14th day and mean difference (0-14th) day between group A, group B and group C. The F-value for 0 day is 6.27 which is significant, for 7th day is 1.63 which is also non-significant and for 14th day is 4.84 is significant.

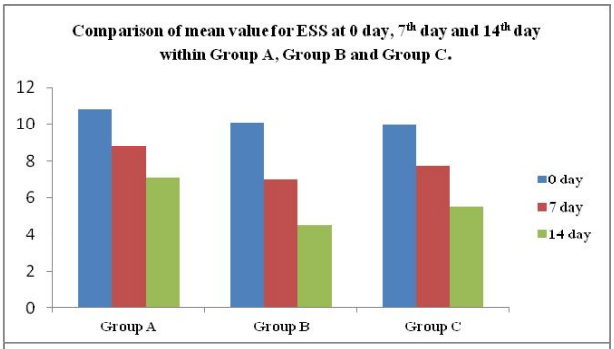
STAI(y2)	GROUP A Vs GROUP B Vs GROUP C	
	F value	P value
0 day	3.293	P > 0.05
7th day	0.831	P > 0.05
14th day	2.496	P > 0.05
MD (0-14th) day	66.69	**P < 0.05**

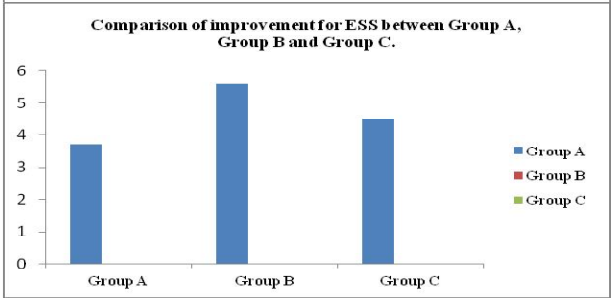
Table 11: Comparison of mean value for STAI (y2) at 0 day, 7th day, 14th day and MD (0-14th) day between Group A, Group B and Group C.

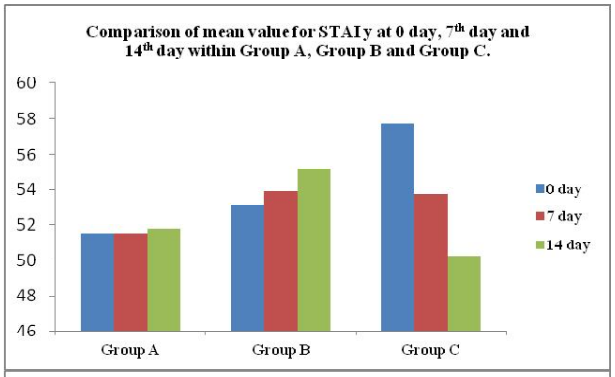
Table 11 shows the comparison of mean value for STAI y2 at 0 day, 7th day and 14th day and mean difference (0-14th) day between group A, group B and group C. The F-value for 0 day is 3.29, for 7th day is 0.83, and for 14th day is 2.49 and all these are non-significant.

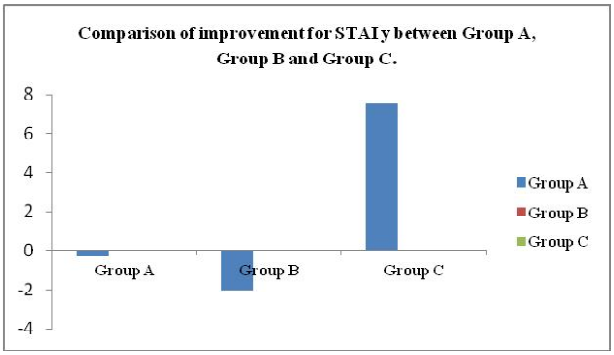


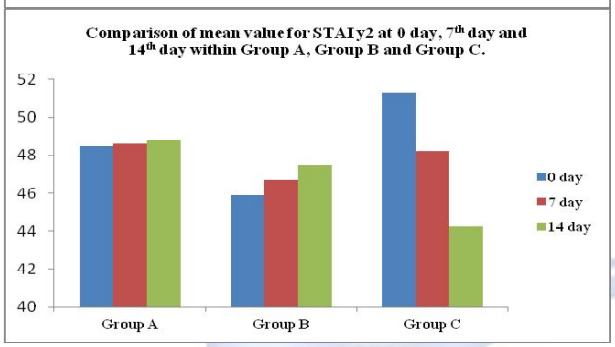


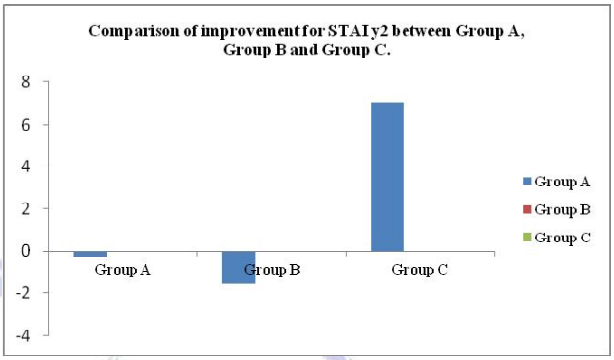












DISCUSSION

The results revealed that conventional treatment along with exercise protocol showed significant effect on FIQ scale but non-significant effect on ESS and STAI y and y2 scale when all three groups were compared with each other. Therefore, alternate hypothesis has been accepted in terms of FIQ. Conventional treatment consists of Hotpack, Ultrasound, Interferential therapy and aerobic exercises. In previous researches who already used conventional as one of his treatment in fibromyalgia are Almeida et al, 2003 [5] and Lofgren and Norrbrink (2009)[6] they also found improvement in pain and sleep pattern in FM. Mechanism behind this can be explained as interferential electric current is a medium frequency wave with low frequency modulated amplitude which helps in promoting analgesia by blocking pain potentials in the dorsal horn of the spinal cord and ultimately leading to stimulation of Aâ myelinated fibers, blockage of C amyelinated afferents, as well as increase in opioid release. In our study Ultrasound therapy was also found to be effective in relieving fibromyalgia symptoms and its use is justified by its effects in reducing pain and ischaemic phenomenon.[1] It improves sustained muscle contraction by increasing the permeability of the cell membrane, improves intracellular energy consumption, increase angiogenesis in ischaemic tissue and promotes tissue repair.

Conventional treatment was found to be ineffective in relieving anxiety as measured on STAI scale in fibromyalgia. It may be because that conventional treatment majorly focuses on the physical impairments but not toward the psychological aspect which is also a major disabling factor in fibromyalgia.

In second group results indicate that Myofascial release along with conventional treatment shows significant effect on FIQ and ESS scale and non-significant effect on STAI scale when all three groups are compared with each other. The positive effect found in our study is in line with the earlier study done by Castro et al, (2010) [7,8] who explained that massage-myofascial release therapy reduces the sensitivity to pain at tender points in patients with fibromyalgia, improving their pain perception and release of fascial restrictions in these patients also reduces anxiety levels leading to improvement in sleep quality, physical function, and physical role. Mechanism behind the effectiveness of myofascial release is that the tissue becomes softer and more pliable after MFR application which helps in restoration of length and health of the tissue that will take off the pressure from pain sensitive structures such as nerves, and blood vessels, as well as restoring alignment and mobility to joints (Barnes 1997) [11]. According to Kadda et al, (1989) [9]; and Gordon et al, (2006) [10] it is found that after application of MFR there is release of endorphins which helps in alleviating anxiety and

depression related symptoms and this could be a possible reason for improvement in STAI scores.

In CBT group results revealed that clinical manifestations of FM improve after Cognitive Behavior Therapy along with conventional and myofascial release therapy. There is a significant effect on FIQ, STAI scale and non-significant effect on ESS scale when all three groups are compared with each other. In CBT technique we basically teach patients the skills necessary to control pain and disability, and help in building their confidence. Earlier studies done by Garcia et al, (2006) [14], Bennett and Nelson(2006) [12] and Redondo et al, (2004) [13] also found that after CBT there occurs improvement in parameters of pain severity, self efficacy and learning of specific technique to cope with chronic pain which is in accordance with the results of our study. Creamer et al. (2000) [13] given CBT along with relaxation training and exercise in their study and found significant improvement in FIQ score, Beck depression inventory, health assessment questionnaire function, tender point score, myalgic score and pain threshold which proves our study.

In present study we observed a significant change in STAI y and y2 scale scores when all three groups are compared with each other. It may be because CBT stimulate the descending inhibitory pain pathway.

The main finding of this study is that after following protocol for fifteen days which included myofascial treatment to the second group and CBT to third group. There was a significant improvement in the scores of FIQ and STAI scales in these groups. But pre and post intervention scores of STAI scale is markedly improve in CBT group. So, it can be said that both myofascial release and CBT are equally effective in improving physical function and anxiety in case of fibromyalgia but CBT more effective in reducing anxiety as compare to MFR.

CONCLUSION

The present study concludes that all three conventional, myofascial release and cognitive behavior therapy treatments are helpful in reducing the symptoms of pain, anxiety and sleep disturbances in case of fibromyalgia. But out of these cognitive behavior therapy is more effective than myofascial release technique in reducing anxiety of fibromyalgic patients. However significant pre and post intervention improvement were seen on STAI and FIQ score hence it is reliable method for reducing anxiety and physical fitness of these patients.

Conflicts of Interest: None

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