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A Contextual Analysis on the Consolidated Impact of Cognitive Behavioral Therapy and Physiotherapy Treatment on Fibromyalgia

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Abstract
Background: *Fibromyalgia (FM) is a ceaseless musculoskeletal torment, which remains a troublesome clinical entity worldwide and the administration of this condition is a challenge for the health providers. Various treatment options are available to improve the symptoms of fibromyalgia, but a specificity tailored to particular patient is still missing. Thus, in this study we tested the combination of cognitive behavioral therapy with physiotherapy techniques would bring any changes on the fibromyalgia symptoms.*
Method: *A 21 year male reported to the psychiatry department with complaints of continuous pain at the back and neck area, with more than 8 months history of stiffness and functional disability. The patient met the 2010 fibromyalgia diagnostic criteria. Visual analogue scale, Pain pressure algometer, revised fibromyalgia impact questionnaire, general anxiety disorder(GAD-7) and shortform-36 health surveys were used as the outcome measures to document the changes. The patient was managed for a period of 3 months using cognitive behavioral therapy along with Physiotherapy techniques.*
Results: *After three months we found positive results on the management of fibromyalgia.*
Conclusion: *Cognitive behavioral therapy combined with integrated Physiotherapy techniques may have an effect to reduce the severity of pain, depression, anxiety, improvement on the pain pressure threshold and quality of life on fibromyalgia.*
Keywords:*Algometry, Cognitive Behavioral therapy, Fascial release, Fibromyalgia.*

I. Introduction

Fibromyalgia (FM) is perceived as a common chronic musculoskeletal pain disorder, characterized by widespread pain, muscle tenderness, decreased pain threshold to pressure, fatigue, stiffness, sleep disturbances, and psychological distress like cognitive mood disturbances, lack of well being, depression or memory problems [1]. The administration of this condition is a test for the health provider [2].

The general predominance of FM in Europe was 4.7% of chronic widespread pain, and was 2.9% when stronger pain and fatigue criteria were simultaneously used[3]. It influences 4% of US population, approximately 6 -10 million Americans[4],with strong female predominance[5]between the age of 20 and 50[6].

The 2010 criteria for diagnosing the FM syndrome recommended by the American College of Rheumatology (ACR) include a history of "widespread pain index (WPI) at ≥7 and symptom severity (SS) scale score ≥5 or WPI 3-6 and SS scale score ≥9" and the symptoms have been present at similar level for at least 3 months and the patient does not have a disorder that would otherwise explain the pain[7].

CBT is a psychological treatment that addresses the interactions between how we think, feel and behave. It is usually time-limited (approximately 10-20 sessions), focuses on current problems and follows a structured style of intervention. Cognitive behavioral therapy (CBT) is a process of teaching, coaching, and reinforcing positive behaviors. CBT helps people to identify cognitive patterns or thoughts and emotions that are linked with behaviors [8].

Myofascial Release (MFR) is one of the manual soft tissue release technique, which applies the principles of biomechanical loading of soft tissue and the neural reflex modifications by stimulation of mechanoreceptors in the fascia[9], [10]; It represents a widely employed manual technique specific for fascial tissues, to reduce adhesions, restore and/or optimize fascia sliding mobility in both acute and chronic conditions.[11]-[13].

Several reports have supported the effectiveness of non-pharmacologic treatment in FM [14, 15].There are dearth of studies reporting synergism of integrated physiotherapy techniques and cognitive behavioral therapy in different constellation of symptoms in FM. Thus, we reported a case of FM treated with the combination of cognitive behavioral therapy and novel physiotherapy techniques.

II. Methods: Case Presentation

A 21 year male reported to the psychiatryoutpatient department of tertiary teaching hospital of North India with complaints of continuous pain all over the body, with more than 8months history of stiffness and functional disability. Area of pain described by the patient was the upper trapezius, neck, hip and abdomen, with characteristic of pain as sharp aching and induced while washing the vessels.

Functional capacity of the patient was restricted to a great extent, such that patient had complaints of difficulty to prepare homemade meal and lift and carry a bag of full of groceries, also patient had disturbance in the quality of sleep. Patient reported depressive features not amounting to syndromal depression. Patient was diagnosed as somatoform disorder according to ICD-10 DCR.

The patient satisfies the2010 fibromyalgia diagnostic criteria such as widespread pain index (WPI) 5 and the symptom severity scale score was 9. Symptoms have been present at the similar level for at least 3 months, and the patient does not have a disorder that would otherwise explain the pain.Written informed consent was obtained from the patient for this case report.

Outcome Measure: Visual analogue scale (VAS) and Pressure algometric measurements were carried out for quantification of pain response. Five areas were selected for measurement of pressure algometric readings –shoulder girdle (left), hip (buttock) left and right, upper& lower back. The areas were chosen based on the complaint. Also, revised fibromyalgia impact questionnaire (FIQR), beck depression index (BDI), quality of life (QOL) and general anxiety disorder (GAD-7)was recorded from the baseline (prior to treatment), first month, and second month and at the end of third month. Rater was blinded to the treatment.

The patient was managed for a period of 3 months. A dosage of 10 week program of CBT (Table 1) was administered for 3 month along with the physiotherapy treatment on alternate days. The physiotherapy treatments included in the study aremoist heat, ultrasound therapy, deep transverse friction and fascial release.

The moist heat therapy was the first treatment applied over the cervical and the low back area for 10 minutes. The Ultrasound (US) treatment was administered in a circular manner over the area of 2 x the size of the transducer (Ultrasound head) with a frequency of 3 MHZ in a continuous mode and a dose of 1.5 W/Cm^2 was delivered at each tender point. The duration of the US treatment is 3 minutes of 3 session / week for 4 weeks.

Deep friction massage has been performed through the therapist fingers perpendicular to the exact site of lesion, with the depth of friction tolerable to the patient. The duration of the treatment 5 minutes of 3 session / week for 12 weeks at each tender point.

Myofascial release (MFR) technique was applied using the cervical release, cranial base release, and leg pull over the point of restriction for at least 3 minutes. Enough rest time given in between the treatment repetitions to avoid any unnecessary fatigue.

TABLE 1: Thorn's CBT Programme [16] .

Session	Description
Week 1	**Discussing the connection between chronic pain and FM**
Week 2	**Identification of automated thoughts.**
Week 3	**Evaluation of automated thoughts.**
Week 4	**Questioning the automatic thoughts and constructing alternatives.**
Week 5	**Nuclear beliefs.**
Week 6	**Nuclear beliefs on pain.**
Week 7	**Changing coping mechanisms.**
Week 8	**Coping with ruminations, obsessions and worrying.**
Week 9	**Expressive writing.**
Week 10	**Assertive communication.**

III. Results

The subject improved in all the measures (Table 2). Marked improvement was reported on Pain pressure threshold (Fig.1), VAS, FIQR,SF-36 survey, BDI and GAD-7 (Fig.2).

TABLE 2: Summary of all the variables

Variables		Baseline(pre – treatment)	1st month	2nd month	3rd month
VAS (Pain)		8	6	5	2
FIQR		55.6	49.5	38	27.1
SF-36	PCS*	29	32.6	38	41.2
	MCS*	31.8	36.7	38	41.2
BDI		39	39	30	28
GAD-7		17	14	16	11
Pain pressure Threshold Measurements (Kg)					
Shoulder Girdle (Left)		2.6	2.9	2.9	3.0

Upper back	1.7	2.3	2.4	3.1
Lower back	1.0	2.5	2.7	2.8
Hip buttock (Right)	1.3	1.7	2.0	2.4
Hip buttock (left)	1.4	1.5	1.8	1.9
*PCS: Physical component summary, *MCS: Mental component summary.				

Fig. 1: Measurements of Pain Pressure Threshold from Baseline to 3rd Month.

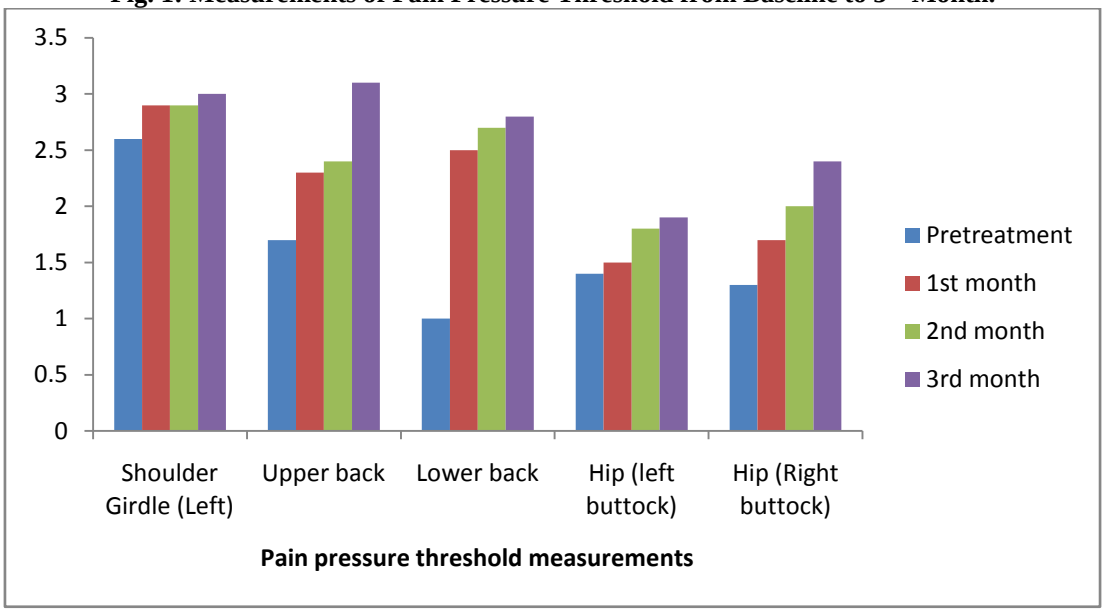
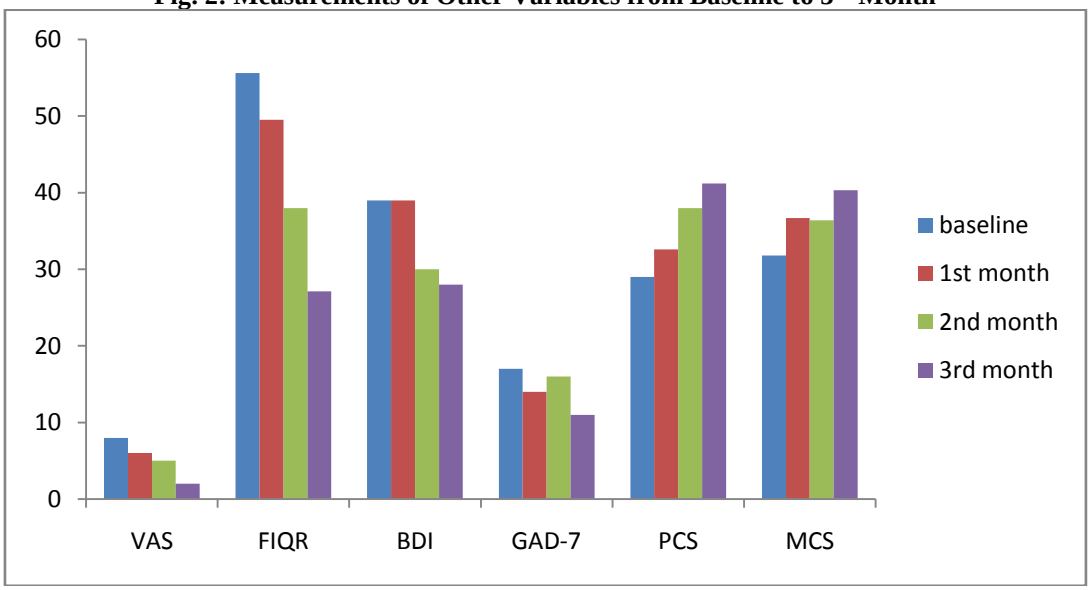


Fig. 2: Measurements of Other Variables from Baseline to 3rd Month



IV. Discussion

This case study has shown a significant improvement on all the outcome measures. To our knowledge, this is the only research which combines both cognitive behavioral therapy and integratedphysiotherapy techniques in the treatment of fibromyalgia.

CBT emphasizes modifying maladaptive thinking and behavioral responses to pain, and typically either avoids patient's negative emotional experiences, or attempts to reduce negative emotions as directly as possible[16].

In this study, the use of ultrasound improves sustained muscle contraction by increasing the permeability of the cell membrane; improves intracellular energy consumption; increases angiogenesis in ischemic tissues; and promotes tissue repair[17].

MFRfacilitate the release of fascialrestrictions[18]and inhibit the gamma spindle response that causes the muscle to shorten when rapidly stretched[19].

Deep cross-friction massage facilitates the proliferation of fibroblasts and results in the facilitation of soft tissue healing and realignment as pressure applied to the muscle is increased [20].

Therefore, it appears that improvement in this index patient could be attributed to the synergism between favorable neurotransmitter changes influencing messenger systems and cellular changes (with tissue healing) due to physiotherapy techniques.

V. Conclusion

Cognitive behavioral therapy with integrated physiotherapy technique synergism is safe and effective, providing long lasting effects on the symptoms of fibromyalgia over a period of 3 months on pain, pressure threshold, anxiety, depression and quality of life. There is need for systematic trials investigating this synergism in future.

Consent: written informed consent was obtained for the publication of this case report.

Conflicts of Interest: Authors confirm that they have no potential conflicts of interest during the study and publication of this research.

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