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Effect of Core Stability Exercises and Electrophysical Agents in Management of Pain and Disability in Chronic Nonspecific Low Back Pain for Computer Users

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Abstract--- Background and purpose: Low back pain (LBA) is a major health problem in industrialized countries and is one of the most common reason for seeking healthcare. Computer professionals who uses laptop or desktop more than 8 hours a day for 5 days a week have higher chance of developing lower back pain. Various physiotherapeutic approach such as exercise and electrotherapy methods used for regular back pain management. The aim of the study was to compare the effect of core stability exercise with electrophysical agents (EPAs) in patient with chronic nonspecific low back pain.

Methods and Materials: A sample of 30 patients within the age group of 25-40 years with chronic nonspecific low back pain who had minimum of three years of work experiences in information technology industry were randomly divided into two groups such as Group A (n= 15) and group B (n= 15). The subjects in group A received core stability exercise and the subjects in group B received electrophysical agents such as interferential current and ultrasound therapy. Both group received 5 session of treatment for two weeks and each participant underwent clinical evaluation on visual analogue scale and Oswestry low back pain disability questionnaire. The pre and posttest measures were tabulated and analyzed by statistical method by t test.

Results: The study concludes that there was statistically significant improvement of functional activities and pain in Group A when compared to Group B in response to treatment.

Conclusion: Based on the result, this study concluded that Core stability exercise was effective than electrophysical agents in chronic nonspecific low back pain.

Keywords--- Core stability exercise, Chronic Nonspecific Low back pain, Electrophysical agents, Visual Analogue Scale , Oswestry disability questionnaire, Computer Users

I. INTRODUCTION

Low back pain[1] is a common disorder involving the muscles, nerves, and bones of the back. Pain can vary from a dull constant ache to a sudden sharp feeling. Low back pain may be classified by duration as acute (pain lasting less than 6 weeks), sub-chronic (6 to 12 weeks), or chronic pain (more than 12weeks). The condition may be further classified by the underlying cause as either mechanical, non-mechanical, or referred pain. People work in sedentary job have higher chance of developing low back pain due to abnormal posture, long sitting hours and development of repeated strain injury. There are lot of treatment approaches available for nonspecific low back pain caused due to computer usage. Multidisciplinary approach such as orthopedic consultation, physical therapy, ergonomic advice and vitamin supplementation showed better improvement in managing chronic low back pain[2].Stability of the spine is provided by the ligaments and muscles of the lower back and abdomen Although weakness of the superficial trunk and abdominal muscles are the first risk factors, recent studies have demonstrated the involvement of weakness and lack of control of the deep trunk muscles, especially the multifidus and transverse abdominis muscles[3].

Electrical modalities such as interferential therapy, ultrasound therapy, thermotherapy cold compression and also various exercise program including strength and flexibility was considered a variety of treatment approach for chronic nonspecific low back pain. Core stability exercise which includes strengthening of abdominal muscles and back extensor played crucial role in stabilising lumbosacral region. In this study comparison was made

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between physical agents and exercise program to find out which one is better to manage low back pain Compared to other treatments. Electro physical agents (EPAs) are those modalities that administer thermal, mechanical, electrical or light energy to the patient to provide physiological effects and therapeutic benefits. They are primarily used in physiotherapy practice as an adjunct to other treatment and management techniques in most situations. When Electro physical agents used along with exercise were beneficial in managing low back pain but the superiority of physical agent and exercise was questionable. In this present study investigate to find out the efficacy of core stability exercise over electrophysical agents The electrophysical modalities used in the study are ultrasound, interferential therapy and Infra-Red Therapy .

II. METHODS

The study was conducted at outpatient Department of physiotherapy under Garden city university. Patients who reported to the department with chronic low back pain not less than 3 months were included in this study whereas subjects with radiating pain and any pathological problem where excluded. Sample of 30 patients within the age group of 25-40 years with chronic low back pain were randomly divided into two groups, A total number of 30 subjects were selected by random sampling method after due consideration to inclusion criteria. The subjects must be computer users works in IT industry at least 8 hours job for 5 days a week have more than 3 years of work experience included in the study[4].They were divided into two groups such as Group A and Group B with 15 subjects each . Group A received core stability exercise and Group B received electrophysical agents for a total duration of 2 weeks, 5 sessions per week. The outcome measure used for this study was visual analogue scale and oswestry low back pain disability questionnaire. Both males and females included in this study. Patient with bulging or disc herniation, spondylolysis, previous back surgery, pregnancy, Inflammatory arthritis, severe cardiovascular or metabolic disease, vertigo / dizziness patients were excluded from the study.

III. PROCEDURE

Both intervention groups underwent a screening program to find out the eligible subjects for this study. There were 30 participants who fulfilled the inclusion and exclusion criteria were selected to participate in this research study all the subjects underwent pretest assessment by visual analogue scale and oswestry disability questionnaire and post test measure was conducted after 2 weeks of intervention by core stability exercise and Electro physiological method.

GROUP A underwent Core stability exercise such as Pressure feedback core exercise in supine & prone , Multifidus exercise , Frontal & Side Plank exercise, Pelvic floor exercises Wobble board oblique twist , Diaphragmatic strengthening exercises , Single leg standing on foam, Tandem standing with perturbation in foam of rapid arm movements were performed as part of core stability exercise[5].The position of the patient varies according to the exercises. Each technique are repeated 10-15 repetitions and following treatments lasted 30-45mins 2 times per day for 2weeks.

GROUP B (Electrophysical Agents)[6] Subjects assigned to the electrophysical agents (EPAs) group received interferential current, ultrasound, and IRR for 2 weeks without any form of physical activity. The passive modalities that were administered included IRR lamp (100 W at 50 cm for 15 minutes), 1 MHz continuous ultrasound (at 1.5 W/cm2 intensity 5 minutes), IFT current (100–130 Hz, 30 min). Treatment session lasted 50 minutes. During the administration of EPAs subjects were in prone position.

IV. RESULTS & TABLES

VISUAL ANALOGUE SCALE[7] FOR GROUP A AND GROUP B

The comparative mean value, mean difference, and unpaired „t" test value between pre and posttest value of visual analogue scale in group A and group B.

Table 1

The below table shows the mean, mean difference and t value of visual analogue scale between Group A and Group B

Visual analogue scale (VAS)	Mean	Mean Difference	Unpaired "t" Value	P Value
Group A	3.60	1.53	2.59	0.01
Group B	5.13			

Graph 1

The below graph shows the mean difference of visual analogue scale of pre and post-test measure for Group A and Group B for the intervention of core stability exercise as well as Electro physiological agents

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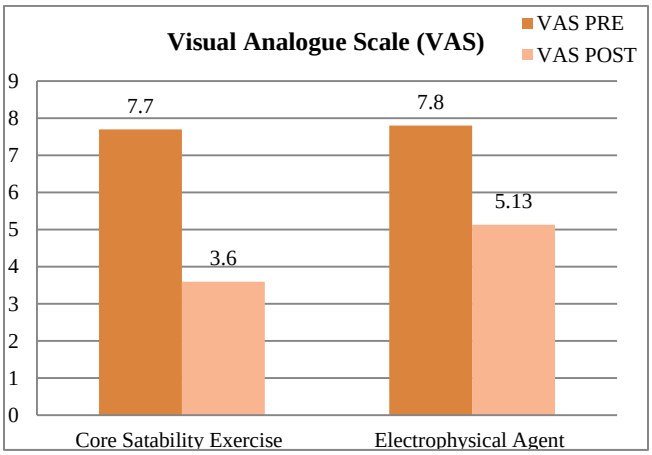

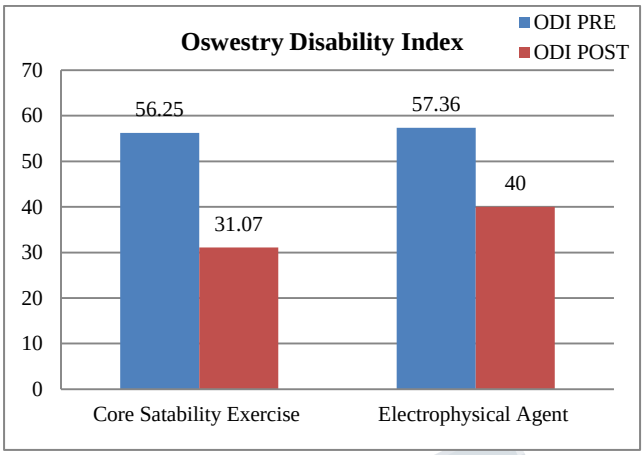

The unpaired „t" value of 2.59 was greater than the tabulated value of which showed that there was statistically significant difference at 0.01 level of significance between Group A and Group B. The Group A mean was 3.60 and Group B mean was 5.13 and the mean difference of Group A & Group B was 1.53 which showed that there was statistically significant improvement in low back pain in response to the treatment in group A when compared to group B.

Oswestry low back pain disability questionnaire[8]

The comparative mean value, mean difference, and unpaired „t" test value between pre and posttest value of Oswestry low back pain disability questionnaire in group A and group B.

Table 2

The below table shows the disability outcome measure of group A and Group B with mean, difference between groups and also the "t" value by unpaired t test

Oswestry pain disability questionnaire	Mean	Mean Difference	Unpaired t Value	P value
Group A	31.07	8.93	2.46	0.02
Group B	40.00			

Graft 2

The below graph shows the mean difference of Oswestry disability index pre and post-test measure for Group A and Group B by the intervention of core stability exercise and Electro physiological agent

The unpaired „t" value of 2.46 was greater than the tabulated value of which showed that there was statistically significant difference at 0.02 level of significance between Group A and Group B. The Group A mean was 31.07 and Group B mean was 40.00 and the mean difference of Group A & Group B was 8.93 which showed that there was statistically significant improvement in low back pain in response to the treatment in group A when compared to group B.

V. DISCUSSION

The purpose of the study was to compare the Core Stability exercise with electrophysical agents for the treatment of work related low back pain in computer professionals . The result of the statistical analysis brings out the following for considerations. Visual analogue scale and Oswestry low back pain disability questionnaire were taken as parameter for pain and function ability in the present study. Core stability exercise and electrophysiocal agents produced significant change in pain and disability for subjects with chronic nonspecific low back pain within two weeks of therapy.

The European Guidelines for Management of Chronic NSLBP recommends supervised exercise therapy as a first-line treatment[9]. Different systematic reviews conducted in past decade have raised a big concern over the role of exercise in management of low back pain, with scarcity of concrete evidence supporting any specific type of exercise, e.g. flexion / extension biased, strengthening of abdominals, McKenzie, stretching exercise[10] Clinical guidelines for low back pain recommends remaining active and early return to active life a mean of faster recovery with less concomitant disability. However, these clinical guidelines are contradictory in practice to prescribing patient specific exercise that varies

According to the individual assessment of the clinician and imply nonspecific general exercise to suggest every low

back patient. Exercises for low back pain have evolved recent past with specific emphasis on the maintaining the spinal stability. These sorts of core stability exercises are designed to improve the neuromuscular control, endurance, strength of muscles central to maintaining dynamic spinal stability. transversus abdominis muscle, lumbar multifidi, and other paraspinal, abdominal, diaphragmatic, and pelvic musculature are targeted in core stability exercises. Various studies have reported delayed activation of transversus abdominis muscle with reference to erector spinae with significant atrophy of multifidus in subjects with chronic low back pain[11]. Since exercise is that the main stay of treatment of low back pain prescribed by physical therapist, it is important to work out the type of exercise that's most specific and targeted in management of low back pain. specific stabilization exercises with routine physical therapy provided in patients with nonspecific chronic low back pain. Studies found that exercise therapy and conventional physiotherapy (comprising a combination of massage, mobilization, hot packs, short-wave diathermy, stretching, traction, ultrasound, flexibility and coordination exercises are equally effective for the treatment of chronic LBP but where McKenzie therapy compared with electrophysical found to be Mckenzie therapy was better than EPAs group in the treatment of patients with chronic LBP[12]. This current study compared core stability exercise with Electro physical agents such as interferential therapy and ultrasound therapy found that significant difference between groups. The level of significance P was 0.01, 0.02 for visual analogue scale and oswestry disability index, respectively.

In this present study core stability exercise group improved VAS score 7.7 to 3.6 similarly electrophysical agent group changed VAS score from 7.8 to 5.13 and also disability measure oswestry score reduced 56.25to 31.07 in group A,57.36 to 40 in group B . The tabulated unpaired t value of 2.59 showed that there was statistically significant difference of 0.01 level between Group A and Group B for VAS score with group A mean was 3.60 and Group B mean was 5.13 and the mean difference of Group A & Group B was 1.53 which showed that there was statistically significant improvement in low back pain in response to the treatment in group A when compared to group B. The tabulated unpaired t‟ value of 1.46 which showed that there was statistically significant difference of 0.02 level between Group A and Group B for Oswestry disability index. The Group A mean was 31.07 and Group B mean was 40.00 and the mean difference of Group A & Group B was 8.93 which showed that there was statistically significant reduction in disability for low back pain in response to the treatment in group A when compared to group B.So there was significant improvement in low back pain in response to the treatment in group A when compared to group B for pain and disability Therefore the present study is rejecting the null hypothesis and accepting the alternate hypothesis.

VI. CONCLUSION

Based on the result, this study concluded that Core Stability exercise was effective than Electrophysical agents in Chronic nonspecific low back pain for computer professionals .

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