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RESEARCH ARTICLE

Efficacy of Balance exercises in chronic low back pain.

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Abstract

Chronic low back pain (CLBP) is one of the most common clinical conditions come across in physiotherapy out - patient department. It is one of the major causes of disability, activity limitation and psychosocial co morbidity. Treatments for chronic back pain can vary greatly. Physical therapy includes patient education and a variety of stretching and strengthening exercises, manual therapies and modalities to treat pain. However balance deficits in individuals with CLBP have been demonstrated in review of literature. With aim to observe effect of balance exercises in CLBP, Cross sectional prospective study was designed. Primary outcome measures were pain (visual analogue scale), disability (Roland Morris Questionnaire), quality of life (12-Item Short-Form Health Survey), and balance (Berg Balance Scale). Control group were given conventional physiotherapy exercises. Experimental group was given balance exercises in addition to conventional exercises. There were no enhancements in any outcome measure after adding balance exercises in treatment protocol of CLBP patients.

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Introduction:-

Low back pain is "silent epidemic" which is one of the major causes of disability, activity limitation and psychosocial co morbidity. Disorders of the back and lumbar spine make up the largest fraction of musculoskeletal injuries and are one of the leading causes of disability in the working years.(Kelsey 1979) Author studied work related musculoskeletal disorders in occupations like traffic police and white collar workers they also showed high prevalence of low back pain.(Shweta 2015) Back pain more than three months considered consider to be chronic. Treatments for chronic back pain can vary greatly depending on the type and source of the pain. The goals of the treatment are to reduce pain, improve quality of life and increase function. These categories include physical therapy, medications, coping skills, procedures and complementary medicine treatments. Physical therapy includes patient education and a variety of stretching and strengthening exercises, manual therapies, modalities (ice, heat, transcutaneous electrical nerve stimulation [TENS], ultrasound, etc.) and taping to treat pain.(Sathya P 2016) Exercise and strengthening are designed to increase stability and strength around the structures in the back that are being stressed. Balance deficits in individuals with CLBP have been demonstrated through increased displacement of the center of pressure while standing upright and greater medial-lateral postural sway.(Mientjes 1999) Despite the documented balance deficit in chronic low back pain patient the rehabilitative protocols for trunk muscle activation primarily focus on strengthening and stretching of trunk muscles only. Thus, in our study we have observed the additional effect of balance exercises in treatment protocol for chronic low back pain.

Material and Methods:-

The written consent was taken from the patient of CLBP. Inflammatory Arthritis, surgically treated, presence of neurological diseases and other co morbidities like diabetes and alcoholism excluded. Subjects were pre evaluated and were divided randomly in two groups; Group 1 is Experimental group, whereas Group 2 is Control group.

Control group were given conventional physiotherapy (strengthening, flexibility exercises, mechanic, electrical modality). Experimental group was given balance exercises in addition to conventional physiotherapy.

Standardized instructions were used to explain the scales, primary outcome measures used were:

Pain intensity assessed with Visual Analog Scale with score ranging from 0 to 10 where 0 is representing no pain and 10 representing severe pain.

Roland Morris Questionnaire used to assess the disability level in subjects as this scale has good reliability and validity in terms of clinical application. (Roland, 1983)

12-Item Short-Form Health Survey is used to assess the quality of life of subjects with chronic low back pain. It provides a comprehensive, psychometric ally sound and efficient way to measure health from patient's point of view by scoring standardized responses to standard questions. It is designed for self- administration. (John, 2014)

Berg Balance Scale is used to objectively determine balance. (Patient's ability to balance during a series of pre - determined task.)It is a 14 item list with each item consisting of 5 point ordinal scale ranging from 0-4; with 0 indicating lowest level of function and 4 is the highest level of function, maximum score is 56 points. After 4 weeks of intervention post evaluation was done.

Result and Discussion:-

Table 1:– Statistical analysis of Visual Analog Scale, Roland Morris Questionnaire, 12 Item Short Form Health Survey (Physical Component).

	VAS pre exercises	VAS post exercise	RMD pre exs	RMD post exs	PCS pre exs	PCS post exs
Mann-Whitney U	195.000	152.500	188.000	160.500	194.000	147.500
Wilcoxon W	405.000	362.500	398.000	370.500	404.000	357.500
Z	-.137	-1.322	-.326	-1.081	-.164	-1.444
Asymp. Sig. (2-tailed)	.891	.186	.744	.280	.870	.149
Exact Sig. [2*(1-tailed Sig.)]	.904 ^a	.201 ^a	.758 ^a	.289 ^a	.883 ^a	.157 ^a

Table 2:– Statistical analysis of 12 Item Short Form Health Survey (Mental Component)

	MCS pre exs	MCS post exs
Mann-Whitney U	151.500	135.500
Wilcoxon W	361.500	345.500
Z	-1.321	-1.765
Asymp. Sig. (2-tailed)	.187	.078
Exact Sig. [2*(1-tailed Sig.)]	.192 ^a	.081 ^a

Table 3:– Statistical analysis of Berg balance Scale

	BBS pre exs	BBS post exs
Mann-Whitney U	199.500	170.000
Wilcoxon W	409.500	380.000
Z	-.014	-.834
Asymp. Sig. (2-tailed)	.989	.404
Exact Sig. [2*(1-tailed Sig.)]	.989 ^a	.429 ^a

Our study population consisted 80% female and 20% male. Both group had 45% subjects between 20 to 35 years of age. Thus age related physiological changes are not influencing results.

As our components were not continuous in value we used nonparametric Mann-Whitney test to calculate significance.

For quantifying pain intensity we used Visual Analog Scale. Lesser number score indicates less pain. Both group showed score reduction post intervention. Which implies physiotherapy intervention have positive outcome in chronic low back pain. (Table no.1)

Disability in daily activities assessed by Roland Morris Questionnaire, disability lessens with score. Both group show reduction in score thus disability decreased.

Further heading towards Quality of Life, we used 12-Item Short-Form Health Survey which has two scales, one for physical and other for mental component. Improvement in 12-Item Short-Form Health Survey is indicated by increase in score. Physical as well as mental component showed statistically significant improvement in both the group. (Table no.1 and 2)

Bergs balance scale used to assess balance. In this increase score denotes improve balance. Improvement in balance noted in both the group. (Table no.3)

However, the experimental and control group shows statistical difference within the group, but when comparison is made between the two groups there is no statistical significance found for all the above component. It implies that additional balance exercises do not have noteworthy impact on the above components in chronic low back pain.

The selection of exercises for the experimental intervention program was based on hypothesis that challenging balance exercises would promote recruitment of the trunk musculature.

Future studies needs to be designed with use of more sensitive method such as balance master to evaluate subtle changes in balance. Also proprioception, visual and vestibular components should be evaluated while assessing balance in chronic low back pain patients.

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