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The Comparison of Hydrotherapy and Land Stretching Exercises in Basis of Chronic Low Back Pain Reduction

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ABSTRACT

In all around the world particularly "America", low back pain is the reason that patients and individuals refer to doctor; this disease is common among the people who are all the time working. Hence, patients suffering from this disease ask for a better remedy to cure their low back pain. Constantly, land stretching exercises are considered as a remedy to reduce low back pain, but recently hydrotherapy has been also considered as a remedy for the patients suffering from low back pain. The present study is actually a comparative study which has studies the effect of hydrotherapy and land stretching exercises on low back pain. In this research, 40 patients within 3 months suffering from low back pain have been studied in which they were divided into two groups, so that, each of the hydrotherapy and land stretching exercises were separately applied on each group. All the process was taken last in 8 weeks that all was done in three days of week for 30 minutes. Oswestry questionnaire was utilized along with the disability of patients' performance, also SR test was utilized along with the disability and low flexibility of back. The results indicated that hydrotherapy exercise had more significant effect than land stretching exercises on patients' low back pain.

Keywords: comparison, land stretching, pain reduction

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INTRODUCTION

Adult individuals suffer from low back pain during their life. Unlike low back pain, which is often caused by muscle strains, chronic low back pain generally persists for more than three months. In America, post flu and cold, low back pain could be the second reason that individuals refer to doctor. Millions of people suffer from low back pain, and land stretching exercises are common exercise therapy for low back pain. However, recently hydrotherapy exercises have been considered as the newer and more effective remedy involving the highest effect on recovery [1]. Hydrotherapy is a therapeutic treatment that involves moving and exercising in water. The special properties of water could provide you with excellent benefits while you are trying to heal a back injury. Being in water provides a safe environment for working out your muscles and stretching your body [2]. It also allows you to do more than you would on land by eliminating the constraints imposed by gravity. The buoyancy of the water helps take the load of your joints. Water exercise is done in shallow, mid-deep and deep water, depending upon your level of conditioning and the goals of your workout, and it creates a significant degree of weightlessness, allowing you to perform movements with ease. To develop range of motion, the goal is to take each body part through its full path of motion [3, 4].

METHODOLOGY

The present study involves the patients who referred to a clinic in Pune, India; and the sample consisted of 40 patients, in which over 6 months the patients suffered from the low back pain, and the patients were 25-50 years old, and they were not pregnant, had not any previous spine surgery or any neurological defects, had not systematic or psychological disorder and their chronic back pain was due to strain and spasm of the muscles. Therefore, two methods of hydrotherapy and stretching exercises were applied on these patients.

Pre taking the physical measurements, researchers introduced the study to prospective participants, completed a demographic information form with the participants, and provided specific instructions to these individuals on how to complete the Oswestry and the VAS. Then, each subject was evaluated for each of the physical variables. The treatment programs, hydrotherapy and land stretching exercises, were conducted over 8 weeks, three days per week in which each session was roughly 30 minutes. the sessions were supervised by the physician, and participants were instructed to report any adverse event, whether it was related to the exercises or not. Groups were instructed not to participate in any other physical program during the study and not to exercise while at home.

RESULTS AND DISCUSSION

The total time for stretching a muscle should generally be about 60 to 90 seconds.⁵ A stretch for 30 seconds only requires 2 or 3 repetitions, and a stretch for 5 or 10 seconds requires more repetitions. The optimal amount of time to hold a stretch to achieve best results is not concluded, whereas even a single 10 second stretch may have some benefits [6, 7]. Although at least thirty seconds is generally recommended for stretching each muscle, also the warm up is recommended pre stretching exercises. Not warming up pre stretching would injure the back. Warm muscles are more flexible than cold muscles and are less likely to tear [8, 9].

We calculated back pain disability during the month in which the treatment programs applied on the patients with the revised Oswestry low back pain disability questionnaire.¹⁰ The revised Oswestry has been designed to assess the influence of LBP on activities of daily living, and leisure functions has been shown to have a high degree of test-retest reliability and internal consistency. The Oswestry questionnaire consists of 10 sections covering aspects of daily life that may be affected by LBP. The items in each section are scored from 0 to 5, and they converted to a percentage of disability score based on the number of answered items. The range of Scores from 0 to 50, and higher scores indicate greater levels of functional difficulties.

Sit and reach

The sit and reach (RS) test is a field test used to measure hamstring and low back flexibility, this test is presented in most health related fitness test batteries because it is believed that maintaining hamstring and low back flexibility may prevent acute and chronic musculoskeletal injuries and low back problems, postural deviations, gait limitations, and risk of falling [11, 12]. Many studies on the validity and reliability of SR test protocols have been reported, and a number has been proposed as well. The assumed validity of the SR test is based on a logical analysis of its requirements [13]. However, Jackson and Baker reported a study that examined the relations between the SR test and criterion measures of hamstring and low back flexibility in girls of 13-15 years old.^{14&15} They found validity coefficients of $r=0.64$ between the SR test and a criterion measure for hamstring flexibility, and $r=0.28$ when compared with a criterion measure for low back flexibility [16]. A standard SR box was placed on the floor, by placing tape at a right angle to the 38 cm mark. The participant sat on the floor, and fully extended one leg, so that; the sole of the foot was flat against the end of the box. She then extended her arms forward, placing one hand on top of the other. With palms down, she reached forward sling hands along the measuring scale as far as possible without bending the knee of the extended leg. Throughout testing, the physiotherapist checked to ensure that the heel remained at the 45 cm mark. Three trials were performed on one side, and then the participant changed leg position and repeated the procedure on the other side. The average of the three trials on each side was used for subsequent analysis. Paired t-test revealed significant difference in the hydrotherapy group with a decrease in disability of movement (RMDQ), the number of change was 14.65 ($p=0.000$), and all these have been shown in table 1. Also, SR test data has shown the increase, the number of change was 5.5 cm ($p=0.000$), it means that the hydrotherapy exercises had the efficiency on flexibility of low back pain and hamstring muscles, and all these have been shown in table 1 as well. Paired t-test revealed significant difference in the land stretching group with a decrease in disability of movement (RMDQ), the number of change was 13.7 ($p=0.000$), and all these have been shown in table 1 as well. Also, SR test data has shown the increase, the number of change was 4.5 cm ($p=0.000$), it means that the stretching exercises program had the efficiency on flexibility of low back pain and hamstring muscles. The difference between pre treatment and post treatment measurements, were calculated as the improvement ratio in both groups.

Table 1- Mean and standard deviation of study variables and the p- value within group comparisons

Hydrotherapy group					Land stretching group			
outcome	Pre test	Posttest	SD	P	Pre test	post test	SD	p
RMDQ	16.42	1.78	2.072	0.000	16.06	2.9	2.161	0.000
SR	8.1	13.6	1.847	0.000	7.9	12.4	.872	0.000

Pre treatment, an independent t-test identified the difference between hydrotherapy and land stretching exercise groups in terms of disability of movement ($p=0.731$), and SR scores ($p=0.645$) were not significant. Therefore, both groups were matched regarding activity limitations. Post treatment, hydrotherapy group yielded higher gains in all variables compared to the stretch group, but an independent t-test did not identify any difference between the hydrotherapy and the stretching groups in term of disability of movement ($p=0.532$), and SR test scores ($p=0.843$), which all these have been shown in table 2.

Table 2-The mean and standard deviation of study variables, the p-value of group comparisons

outcome	Hydro Pre test	Land stretching Pretest	SD	<i>P</i>	Hydro Post test	Land stretching post test	SD	<i>p</i>
RMDQ	16.42	16.06	1.334	0.731	1.78	2.9	.453	0.532
SR	8.1	7.9	1.241	0.645	13.6	12.4	.343	0.843

CONCLUSION

It could be concluded that the recovery through hydrotherapy exercise was more significant than the land stretching exercise. Hydrotherapy and land stretching exercises during 8 weeks, are highly significant for the patients suffering from low back pain both methods, Hydrotherapy and land stretching exercises, would be effective and cure the low back pain in this research, in which the increase of flexibility would be realized as well.

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