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Physiotherapy for Low Back Pain

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Mini Review

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Abstract

The biopsychosocial model for pain management is widely accepted worldwide. As the mechanisms of pain is multidimensional, management should also be multifaceted, in the core of subacute & chronic pain management, physiotherapy might be considered almost for every & each patient Several mechanisms have been adopted to explain how physical therapy help such wide category of patients. When planned properly, the benefits are many, & side effects are less, patient selection& education plays a crucial role to achieve these goals.

Keywords: Back Pain; Exercise; Complex Barriers; Musculoskeletal Disorder

Introduction

Low back pain (LBP) by fare, is the most prevalent musculoskeletal disorder all over the world. Up to 85 % of all population suffering LBP during their lifetimes [1-5].

Exercise is frequently recommended to patients with LBP, it has proven to reduce pain and maintain or restore strength flexibility, & endurance [6].

Subacute and Chronic Low Back Pain& the Benefit Of Exercise

LBP can be classified according to the duration of symptoms as;

- Acute; less than 4 weeks
- Subacute; 4 to 12 weeks
- Chronic; more than 12

The role of exercise varies according to the duration of back pain symptoms, exercise is advisable for all patients with subacute and chronic LBP when there is decreased strength, muscle atrophy, endurance, and easy fatigability [7-11].

Several systematic reviews have shown that exercise improved pain and function in patients with subacute and chronic LBP [12], Moreover, patients with chronic LBP who regularly participate regularly in physical activities have less pain and better function compared to those who are less physically active [13-19].

Mechanisms

The mechanism by which exercise improves symptoms is not clear. Several mechanisms can contribute to the benefit, including neurologic, musculoskeletal, and psychological [20].

Tissue injury leads to complex changes within the peripheral and central nervous system, cell proliferation and neurotrophic factors may amplify the processing of pain from the originally injured tissue and result in the perpetuation of pain symptoms [21].

Several animal studies have shown that exercise can reverse some of these injury-induced neurologic changes in the sensory ganglia, spinal cord, and brain [22]. Exercise also improves behavioral markers of pain. These animal studies suggest that exercise would induce similar changes in the peripheral and central nervous systems that contribute to the production, maintenance, and resolution of pain, including LBP [23]. In addition to animal studies, human studies have found that elevated pro-inflammatory cytokines

and oxidative stress accompany LBP, and exercise ameliorate such inflammatory processes [24-26].

Exercise does have a positive effect on the metabolism of human muscles, joints, and intervertebral discs. These tissues require regular loading so that they can maintain their normal metabolism and be able to repair repetitive micro trauma [27]. It is well known that intervertebral discs do not receive a blood supply and obtains their nutrients and metabolism by imbibition (the direct absorption of fluid by the disc), which can be optimized by continuous motion and impact [28-31].

Exercise also provides psychological benefits, including significant decrease in stress, anxiety, and depression. It has been proven that here is a strong association between chronic LBP and depression, and exercise can improve the mood of chronic LBP patients which, in turn, can lead to an increase in their level of physical activity [32-37]. Some patients may be worried about reinjuring their back and exhibit significant fear of movement (kinesophobia); in such patients, exercise can be a means by which they learn to confront and overcome their fear. In addition, physical activity interventions can improve the perception of exercise self-efficacy in activity-restricted individuals [38].

Counseling and Evaluation

Counseling patients regarding their expectations is essential prior to recommending and initiating an exercise. In addition, addressing patient fears and concerns and assessing fitness level, interests, prior participation in exercise, and availability of resources are necessary in formulating an appropriate exercise plan [39].

Motivational interviewing and motivational enhancement therapy techniques can improve exercise motivation and compliance in patients with chronic LBP [40]. Health coaching for people with LBP with low recovery expectations can result in goal setting and action planning. These individuals report complex barriers, demotivators, and motivators to performing exercise. Demotivators to exercise are so many, including, but not limited to, lack of interest, unavailability, unaffordable coast, self-consciousness, embarrassment, anxiety, frustration, and anger. On the other hand, motivators to exercise may include goal setting and achieving, enjoyment, feeling good and "normal," optimism, self-redefinition, and "escape from everyday boundaries."

Patients with LBP need to have clear and consistent follow up from their health care providers regarding treatment options including self-management, as well as information on prognosis and impact on their occupation [41].

Patient Education

Educating patients regarding incorrect understanding about the role of structural back "abnormalities" as the cause of their back pain. Patients who have had prior imaging may misunderstand the importance of the anatomic variations that have been identified, such as desiccated, narrow, degenerating, bulging, or herniated discs; facet joint arthritis; ligamentum flavum hypertrophy; Schmorl's nodes; spinal stenosis; and hemangiomas. We have to educate patients that these anatomic findings are not necessarily associated with their pain, do not necessarily require intervention, and can be found in without any symptoms. Patients need to be educated that although these anatomic variations may persist, however, their, pain can be still well managed and improve over time [42].

Patients may believe or have previously received advice that certain activities (e.g., bending from the waist, twisting, lifting heavy items, exercise, and sports activities that stress the spine) are unsafe, particularly if those activities provoke discomfort. Providing education by offering a neurologic explanation for provoked pain as an abnormally low pain stimulus threshold may be helpful for some patients. It may also be helpful to challenge patient concerns such as having been told that they have an "unstable" spine; "misaligned" vertebrae, hips, and/or sacroiliac joints; or a leg length discrepancy [43]. These "diagnoses" are usually incorrect and are not generally accepted as contributory to symptoms.

Possibility of Exacerbation in Low Back Pain with Exercise

Some patients might experience temporary worsening of pain during or after therapeutic exercise. Counseling& reassuring the patient can reduce kinesiophobia [44]. Increased LBP following exercise is not uncommon, usually benign, and simply indicates that the pain-producing tissues have been stimulated. Overall, when compared with non-exercising control populations, exercise does not appear to increase the risk of LBP exacerbations.

Evaluating Exercise Options

All patients with subacute and chronic LBP will likely derive benefit from physical activity, but there is significant variability in exercise ability and tolerance among patients, which should be considered when making exercise program recommendations. Some patients may never have been regularly physically active, while others may have stopped or greatly diminished physical activities and exercise because of their pain. Patients who have never been active should be encouraged to begin exercise but may benefit from a supervised graded program with more support. Patients

who are already active and exercising should be encouraged to continue [45].

Exploration of the exercise options available within the patient's community, while taking into consideration their preferences, circumstances, fitness level, and exercise experiences, will help to determine the most appropriate exercise program [46]. Referral to physical therapy for formal exercise instruction and education may be reasonable for some patients who might benefit from a more structured, guided approach such as those with subacute or chronic LBP and significant functional impairment, deconditioning, and fear-avoidance of movement.

Conclusion

Nowadays, it is widely believed that multimodal approach must the norm for proper pain management
Physical therapy is an essential component for managing subacute& chronic LBP, However, patient education& follow up is of paramount importance to correct the myths & misunderstanding that might affect patient compliance.

References

1. Woolf AD, Pfleger B (2003) Burden of major musculoskeletal conditions. Bull World Health Organ 81: 646.

2. Rainville J, Hartigan C, Jouve C, Martinez E (2004) The influence of intense exercise-based physical therapy program on back pain anticipated before and induced by physical activities. Spine J 4(2): 176-183.

3. Hayden JA, Van Tulder MW, Malmivaara A, Koes BW (2005) Exercise therapy for treatment of non-specific low back pain. Cochrane Database Syst Rev 3: CD000335.

4. Rainville J, Hartigan C, Martinez E (2004) Exercise as a treatment for chronic low back pain. Spine J 4(1): 106-115.

5. Steele J, Bruce Low S, Smith D (2014) A reappraisal of the deconditioning hypothesis in low back pain: review of evidence from a triumvirate of research methods on specific lumbar extensor deconditioning. Curr Med Res Opin 30(5): 865-911.

6. Chou R, Huffman LH (2007) Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society/American College of Physicians clinical practice guideline. Ann Intern Med 147(7): 492-504.

7. Searle A, Spink M, Ho A, Chuter V (2015) Exercise interventions for the treatment of chronic low back pain: a systematic review and meta-analysis of randomised controlled trials. Clin Rehabil 29 (12): 1155-1167.

8. Pinto RZ, Ferreira PH, Kongsted A (2014) Self-reported moderate-to-vigorous leisure time physical activity predicts less pain and disability over 12 months in chronic and persistent low back pain. Eur J Pain 18(8): 1190-1198.

9. Van Middelkoop M, Rubinstein SM, Verhagen AP (2010) Exercise therapy for chronic nonspecific low-back pain. Best Pract Res Clin Rheumatol 24(2): 193-204.

10. Payne C, Wiffen PJ, Martin S (2017) Interventions for fatigue and weight loss in adults with advanced progressive illness. Cochrane Database Syst Rev 4: CD008427.

11. Woolf CJ (2010) What is this thing called pain?. J Clin Invest 120 (11): 3742-3744.

12. Nijs J, Clark J, Malfliet A, Ickmans K, Voogt L, et al. (2017) In the spine or in the brain? Recent advances in pain neuroscience applied in the intervention for low back pain. Clin Exp Rheumatol 35 (S107): 108-115.

13. Cobianchi S, Casals Diaz L, Jaramillo J, Navarro X (2013) Differential effects of activity dependent treatments on axonal regeneration and neuropathic pain after peripheral nerve injury. Exp Neurol 240: 157-167.

14. Chen YW, Lin MF, Chen YC, Hung CH, Tzeng JI, et al. (2013) Exercise training attenuates postoperative pain and expression of cytokines and N-methyl-D-aspartate receptor subunit 1 in rats. Reg Anesth Pain Med 38(4): 282-288.

15. Detloff MR, Smith EJ, Quiros Molina D, Ganzer PD, Houle JD, et al. (2014) Acute exercise prevents the development of neuropathic pain and the sprouting of non-peptidergic (GDNF- and artemin-responsive) c-fibers after spinal cord injury. Exp Neurol 255: 38-48.

16. Almeida C, DeMaman A, Kusuda R, Cadetti F, Ravanelli MI, et al. (2015) Exercise therapy normalizes BDNF upregulation and glial hyperactivity in a mouse model of neuropathic pain. Pain 156(3): 504-513.

17. Kuphal KE, Fibuch EE, Taylor BK (2007) Extended swimming exercise reduces inflammatory and peripheral neuropathic pain in rodents. J Pain 8(12): 989-997.

18. Mazzardo Martins L, Martins DF, Marcon R, Santos UDD, Speckhann B, et al. (2010) High-intensity extended swimming exercise reduces pain-related behavior in mice: involvement of endogenous opioids and the

serotonergic system. J Pain 11(12): 1384-1393.

19. Stagg NJ, Mata HP, Ibrahim MM, Henriksen EJ, Porreca F, et al. (2011) Regular exercise reverses sensory hypersensitivity in a rat neuropathic pain model: role of endogenous opioids. Anesthesiology 114(4): 940-944.

20. Chen YW, Li YT, Chen YC, Li ZY, Hung CH (2012) Exercise training attenuates neuropathic pain and cytokine expression after chronic constriction injury of rat sciatic nerve. Anesth Analg 114(6): 1330-1337.

21. Martins DF, Mazzardo Martins L, Soldi F (2013) High-intensity swimming exercise reduces neuropathic pain in an animal model of complex regional pain syndrome type I: evidence for a role of the adenosinergic system. Neuroscience 234: 69-76.

22. Luan S, Wan Q, Luo H, Li X, Ke S, et al. (2015) Running exercise alleviates pain and promotes cell proliferation in a rat model of intervertebral disc degeneration. Int J Mol Sci 16(1): 2130-2144.

23. Kim YJ, Byun JH, Choi IS (2015) Effect of Exercise on μ-Opioid Receptor Expression in the Rostral Ventromedial Medulla in Neuropathic Pain Rat Model. Ann Rehabil Med 39(3): 331-339.

24. Chuganji S, Nakano J, Sekino Y, Hamaue Y, Sakamoto J, et al. (2015) Hyperalgesia in an immobilized rat hindlimb: effect of treadmill exercise using non-immobilized limbs. Neurosci Lett 584: 66-70.

25. Cheng YY, Kao CL, Ma HI, Hung CH, Wang CT, et al. (2015) SIRT1-related inhibition of pro-inflammatory responses and oxidative stress are involved in the mechanism of nonspecific low back pain relief after exercise through modulation of Toll-like receptor 4. J Biochem 158(4): 299-308.

26. Powers SK, Jackson MJ (2008) Exercise-induced oxidative stress: cellular mechanisms and impact on muscle force production. Physiol Rev 88(4): 1243-1276.

27. McArdle A, Jackson MJ (2000) Exercise, oxidative stress and ageing. J Anat 197(4): 539.

28. Belavý DL, Quittner MJ, Ridgers N (2017) Running exercise strengthens the intervertebral disc. Sci Rep 7: 45975.

29. Piercy KL, Troiano RP, Ballard RM (2018) The Physical Activity Guidelines for Americans. JAMA 320(19): 2020-2028.

30. Herring MP, O'Connor PJ, Dishman RK (2010) The effect of exercise training on anxiety symptoms among patients: a systematic review. Arch Intern Med 170(4): 321-331.

31. Schuch FB, Vancampfort D, Firth J, Rosebaum S, Ward PB, et al. (2018) Physical Activity and Incident Depression: A Meta-Analysis of Prospective Cohort Studies. Am J Psychiatry 175(7): 631-648.

32. Rainville J, Sobel JB, Hartigan C, Wright A (1997) The effect of compensation involvement on the reporting of pain and disability by patients referred for rehabilitation of chronic low back pain. Spine (Phila Pa 1976) 22(17): 2016-2024.

33. Wegner M, Helmich I, Machado S, Nardi AE, Arias Carrior O, et al. (2014) Effects of exercise on anxiety and depression disorders: review of meta- analyses and neurobiological mechanisms. CNS Neurol Disord Drug Targets 13(6): 1002-1014.

34. Marshall PWM, Schabrun S, Knox MF (2017) Physical activity and the mediating effect of fear, depression, anxiety, and catastrophizing on pain related disability in people with chronic low back pain. PLoS One 12: e0180788.

35. Lee LL, Arthur A, Avis M (2008) Using self-efficacy theory to develop interventions that help older people overcome psychological barriers to physical activity: a discussion paper. Int J Nurs Stud 45(11): 1690-1699.

36. Vong SK, Cheing GL, Chan F, So EM, Chan CC (2011) Motivational enhancement therapy in addition to physical therapy improves motivational factors and treatment outcomes in people with low back pain: a randomized controlled trial. Arch Phys Med Rehabil 92(2): 176-183.

37. Iles RA, Taylor NF, Davidson M, O'Halloran P (2014) An effective coaching intervention for people with low recovery expectations and low back pain: a content analysis. J Back Musculoskelet Rehabil 27(1): 93-103.

38. Newitt R, Barnett F, Crowe M (2016) Understanding factors that influence participation in physical activity among people with a neuromusculoskeletal condition: a review of qualitative studies. Disabil Rehabil 38(1): 1-110.

39. Lim YZ, Chou L, Au RT, Seneviwickrama KMD, Cicuttini FM, et al. (2019) People with low back pain want clear, consistent and personalised information on prognosis, treatment options and self-management strategies: a systematic review. J Physiother 65(3): 124-135.

40. Bodes Pardo G, Lluch Girbés E, Roussel NA, IzquierdoTG,

Penick VJ, et al. (2018) Pain Neurophysiology Education and Therapeutic Exercise for Patients With Chronic Low Back Pain: A Single-Blind Randomized Controlled Trial. Arch Phys Med Rehabil 99: 338.

41. Ben Ami N, Chodick G, Mirovsky Y, Pincus T, Shapiro Y (2017) Increasing Recreational Physical Activity in Patients With Chronic Low Back Pain: A Pragmatic Controlled Clinical Trial. J Orthop Sports Phys Ther 47(2): 57-66.

42. Kernan T, Rainville J (2007) Observed outcomes associated with a quota-based exercise approach on measures of kinesiophobia in patients with chronic low back pain. J Orthop Sports Phys Ther 37(11): 679-687.

43. Brinjikji W, Luetmer PH, Comstock B, Bresnahan BW, Chen LE, et al. (2015) Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. AJNR Am J Neuroradiol 36(4): 811-816.

44. Ishimoto Y, Yoshimura N, Muraki S, Yamada H, Nagata K, et al. (2013) Associations between radiographic lumbar spinal stenosis and clinical symptoms in the general population: the Wakayama Spine Study. Osteoarthritis Cartilage 21(6): 783-788.

45. Choi BK, Verbeek JH, Tam WW, Jiang JY (2010) Exercises for prevention of recurrences of low-back pain. Cochrane Database Syst Rev 1: CD006555.

46. Slade SC, Patel S, Underwood M, Keating JL (2014) What are patient beliefs and perceptions about exercise for nonspecific chronic low back pain?. A systematic review of qualitative studies. Clin J Pain 30(11): 995-1005.