

Exercise compliance and the gym ball: a case study

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Manipulation and exercise are recommended by chiropractors for treatment and prevention of low back problems. Many patients stop their exercise program with improvement in their symptoms. The success of exercises for the prevention of low back pain is dependent on several factors, one being continued compliance to the program. Only a small percentage of the general population do regular exercise; therefore, it is essential that patients recognize the importance of regular exercise in reducing the recurrence of their low back pain. This case study shows how the use of a gym ball appears to have improved compliance and reduced the incidence of low back pain for one patient with a history of re-occurring low back pain and a poor record of exercise compliance. The question must be asked, is this an case incident or is use of the gym ball an appropriate treatment for low back pain? (JCCA 2001; 45(4):221-224)

Les chiropracteurs recommandent la manipulation et l'exercice pour traiter les problèmes de lombalgie et pour les prévenir. Cependant, de nombreux patients abandonnent leur programme d'exercice dès qu'ils perçoivent des symptômes d'amélioration. Or, la réussite de ces exercices de prévention de la lombalgie dépend de plusieurs facteurs, notamment de l'observance permanente du programme. Seul un faible pourcentage de la population générale effectue régulièrement des exercices; il est donc essentiel que les patients reconnaissent l'importance de la pratique régulière d'exercices pour minimiser la récurrence de la lombalgie. Cette étude de cas démontre dans quelle mesure l'utilisation d'un ballon de gymnaste a amélioré l'observance et réduit la fréquence des lombalgies dans le cas d'un patient qui présentait des antécédents de lombalgie récurrente et qui n'observait pas le programme d'exercices de façon satisfaisante. La question qui se pose est la suivante : s'agit-il d'un hasard ou le ballon de gymnaste constitue-t-il un traitement approprié pour la lombalgie? (JACC 2001; 45(4):221-224)

KEY WORDS: exercise, gymball, low back pain.

MOTS CLÉS : exercice, ballon de gymnaste, lombalgie.

Introduction

Comprehensive exercise programs with different types of exercise have been used in an attempt to treat and prevent lower back pain. Compliance seems to be a universal problem in any exercise program.¹ From 60% to 80% of the general population suffer lower back pain.² For this reason

it is imperative that we utilize all the tools possible for effective and efficient prevention, treatment, and rehabilitation of low back pain. A multitude of articles and studies as well as proposed guidelines have been published expounding the virtues of manipulation and exercise as the preferred methods of treatment. A better understanding of

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joint fixation and the components of joint stability have led to a better understanding of the requirements of treatment.²⁻⁸

Panjabi has suggested that spinal stabilization relies on three subsystems.

Components of the spinal stabilization system

- (1) muscles (active component)
- (2) ligaments (passive component)
- (3) the central nervous system (controlling component)

These subsystems are interdependent, and one is capable of compensating for deficits in another. According to this hypothesis, spinal instability is influenced by control of intersegmental motion.^{9,10}

The concept of muscle grouping was first described by Leonardo Da Vinci, who suggested that the central muscles of the neck stabilized the spinal segments, and the more lateral muscles acted as guy ropes supporting the vertebrae.¹¹ Bergmark has categorized trunk muscles into local and global muscle systems. Local muscles are the deep muscles, including intersegmental muscles, and are responsible for intersegmental stiffness.¹² Global muscles are the more superficial muscles of the trunk, and are responsible for balancing external loads applied to the trunk so that the local muscle can handle the forces transferred to the spine.¹² Bogduk has suggested that the intrinsic muscles (interspinales and intertransversari) have a proprioceptive function. Their value is in monitoring the vertebral column's movements and influencing the action of the surrounding muscles.¹³

Mead and co-workers suggested that manipulation is beneficial for chronic low back pain.¹⁴ Triano et al. reported improved function and pain reduction with manipulation.¹⁵ Erhard and Delitto demonstrated that manipulation and exercise outperformed exercise alone.¹⁶ Studies by Mitchell and Cameron¹⁷ and Lindstrom et al.¹⁸ have shown an increased benefit from active care over passive physical therapies. According to Liebenson, "manipulation and exercise both appear to be of value if our beliefs are based on the scientific literature".²

One of the most important factors in any exercise program, no matter how appropriate it may be, is patient compliance. To achieve compliance it is necessary that patients recognize "that body mechanics and functional improve-

ment are essential for long-term success".¹⁹ Liebenson states that patients "must learn that rehabilitation or restoration of function will prevent pain from arising in the first place, and although such rehabilitation may be more painful in the short term, improving function is the key to long term relief".²⁰ The purpose of this case study is to show how lack of compliance was overcome in the treatment and rehabilitation of one patient, and to stimulate study of the use of a gym ball for the treatment of low back pain.

Case report

Clinical practices often include patients with recurring episodes of acute lower back pain. These patients often improve after several visits and are fine until the next episode of lower back pain. This trend continues for several years and often will slowly become more severe and/or recurring more frequently.

This is a report of such a patient, a 44-year-old male suffering with severe acute lower back pain. He had experienced similar episodes, varying between 1-5 weeks duration, over the past seven years. No significant trauma was associated with the onset of the symptoms.

The patient has a sedentary occupation that involves sitting at a desk most of the day. He is an active recreational athlete, participating in several sports at a very competitive level. On occasion his lower back pain can be associated with his sports activities, which include ice hockey, football and baseball. However, for the episode in question, the patient stated that there was no single precipitating incident, but only gradual onset of the symptoms. Symptoms included severe pain bilaterally in the lumbar spine, with extensive lumbar muscle spasms and a very limited range of motion. His movements when walking were very deliberate and guarded. All trunk and lower extremity motions, passive or active, were extremely painful and limited. Due to the severity of pain and muscle spasms, orthopedic testing was very limited. Palpation revealed bilateral fixation of the sacroiliac joints, as well as fixation of the fifth lumbar vertebra.

The patient showed a slow and steady improvement with spinal manipulation. As the patient's symptoms improved, light lumbar stabilization exercises were introduced. This proved of limited success due to the patient's failure to follow through with the prescribed exercises. In an attempt to improve compliance, a variety of exercises on a gym ball were recommended. The prescribed floor

exercises and gym ball exercises targeted specific muscle groups to assist in lower back stability.

After four weeks of therapy, the patient reported that he was free of symptoms. He was advised to continue his exercise program. Further visits were made at three month intervals. The patient stated that he was not doing the exercises but had persisted in sitting each night on the gym ball for twenty to thirty minutes. He reported that sitting on the gym ball after work every night seemed to relieve his back tension. Over the past ten years this patient has been given a variety of exercises to help reduce the incidence and reoccurrence of his low back pain. He reported that he had not continued with them after the pain had subsided. With this episode, this trend continued as he stopped doing the ball exercises. However, the patient did continue sitting on the ball every evening after work. He has continued sitting on the gym ball every night for approximately 30 minutes. Prior to the use of the gym ball, this patient was seen an average of seven times per year from 1990 to the end of 1998. After he began using the gym ball, he was seen only three times from late 1998 to the present. In this case, it would appear that performing the simple task of sitting on the gym ball every day has led to a significant reduction in recurrence of lower back pain.

Discussion

Recently, several studies have confirmed the appropriateness of both chiropractic manipulation and exercise for the treatment of low back pain.^{5,6,7} Poor compliance with an exercise program is often the most limiting drawback of exercise prescribed for prevention and rehabilitation.¹ Although the health benefits of exercise are well documented, estimates indicate that only 10–20% of the 18–65-year-old population regularly exercise.¹

This patient had responded well to chiropractic care in the past, but his history of exercise compliance was poor. In an attempt to improve compliance, a change was initiated in the exercise approach by introducing the use of a gym ball and specific gym ball exercises. This approach was suggested to encourage him to continue the exercises after the pain had subsided, in an attempt to improve low back stability, which should limit recurrences of lower back pain.

An effective exercise program must address all of the functional deficits of the stabilization components. Rehabilitation must not aggravate the presenting symptoms.

Advantages of the gym ball are that it is safe, minimizes injury and helps to activate proprioception, balance, and equilibrium control, thus addressing deficits in the stabilization components.²¹

Although specific lumbar stabilization exercises were recommended for this patient, he did not continue them after his pain had subsided. He continued only sitting and balancing on the gym ball on a daily basis. This case shows how compliance with a simple balance exercise apparently helped to rehabilitate and significantly reduce reoccurrence of low back pain for this patient. In this instance, ease of use may have promoted compliance, and compliance may have contributed to the reduction in the incidence of lower back pain. This case also shows that compliance with a simple non-forceful program, sitting and balancing on the gym ball, may help rehabilitate a chronic low back problem and significantly reduce recurrence of low back pain.

Conclusion

This is only a single case study and its significance should be judged on that basis. However, this case study raises a question: is the gym ball an effective tool for the treatment of low back pain in patients? With this patient, the use of the gym ball, even in this limited way, seemed to encourage exercise compliance and apparently reduced the incidence of low back pain. Was this an isolated case or is there potential for the use of the gym ball in this simple fashion for rehabilitation of low back pain? This question opens the door for further discussion and investigation.

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