

ARTIGO ORIGINAL

Hydrotherapy study in patients with “failed back surgery syndrome” – a therapeutic option?

Estudo da hidroterapia em pacientes com síndrome pós-laminectomia – uma opção terapêutica?

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ABSTRACT

The study was carried out to evaluate the efficacy of hydrotherapy on “failed back surgery syndrome”. Eight participants were assigned to an aquatic exercise group. The analgesic medication was withdrawn during the study. Evaluation parameters included the results of the Visual Analogue Scale (VAS) score and spine mobility. The patients were assessed at baseline and at the end of the 6-week follow-up period. The results showed that hydrotherapy had a positive impact on the outcome of chronic post-surgical low back pain. After 6 weeks of hydrotherapy, without analgesic medication, the overall mobility of the spine improved and back pain decreased. We conclude that aquatic exercises may positively impact the outcome of “failed back surgery syndrome”, probably remaining one of the few successful measures in the management of this kind of patient.

KEYWORDS

back pain, pain measurement, hydrotherapy, rehabilitation

RESUMO

O presente estudo foi realizado para avaliar a eficácia da hidroterapia na “síndrome pós-laminectomia”. Oito participantes foram designados para um grupo de exercícios aquáticos. A medicação analgésica foi descontinuada durante o estudo. Os parâmetros de avaliação incluíram o escore da Escala Visual Analógica (EVA) e a mobilidade da coluna vertebral. Os pacientes foram avaliados em condições basais e ao final do período de seguimento de seis semanas. Os resultados mostraram que a hidroterapia teve um impacto positivo nos resultados da dor lombar crônica pós-cirúrgica. Após seis semanas de hidroterapia, sem medicação analgésica, a mobilidade geral da coluna melhorou e a dor lombar diminuiu. Concluímos que exercícios na água podem ter um impacto positivo no resultado da síndrome da falência da cirurgia lombar, provavelmente sendo uma das poucas medidas bem sucedidas no tratamento desse tipo de paciente.

PALAVRAS-CHAVE

dor nas costas, medição da dor, hidroterapia, reabilitação

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INTRODUCTION

Failed back surgery syndrome (FBSS) incorporates a heterogeneous group of patients with residual chronic disabling lower back pain after spinal surgical treatment.¹

It is an increasing and challenging problem encountered in pain-treatment settings, due to some kind of enthusiasm in the past with surgical approach of back pain. There is a permanent search for the causes and the action mechanisms of this syndrome, as well as the effective method of treatment,^{2,3} trying to minimize the socio-economic impact, in particular the working disability.

The majority of patients achieves only partial relief of symptoms and usually is unsatisfied with the conservative or pharmacological management, including the classic physiatric approach. They are continually treated with the same kind of options, only changing the "Pain management clinic", and in many cases, only changing the doctor at the same Hospital or Clinic.

Most of the therapeutical options have small or transient effects that limit their value in chronic low back pain, but some reports available today, suggest significant benefits in patients with low back pain in hydrotherapy back exercise sessions.^{4,5}

Aquatic therapy is a rehabilitation alternative for the treatment of spinal pain and dysfunction, which is advocated as an appropriate method to decrease pain and restore function.^{6,7}

Exercise produces large reductions in pain and disability, a feature that should play a major role in the management of chronic low back pain.⁸ The physical properties of the water make it an ideal environment for active physical therapy of low back injuries, improving spinal strength, flexibility and general mobility.^{9,10}

The aim of our study was to evaluate the effects of hydrotherapy, on pain and spinal flexibility, in patients with failed back surgery syndrome.

OBJECTIVE

The study was undertaken to evaluate the efficacy of hydrotherapy on "failed back surgery syndrome".

METHOD

The study was a open trial, in which eight participants with a diagnosis of FBSS, were assigned. The analgesic medication was suspended during the study.

The hydrotherapy was applied in a swimming pool twice a week for 6 weeks. The programme was carried out with the same physiotherapist. The patients were assessed 2 times: at baseline and at the end of the 6-week follow-up period.

Outcome measures included the results of the Visual Analogue Scale (VAS) score and lumbar motion.

Participants

Eight subjects with a diagnosis of FBSS were recruited. After an individual assessment by a physiatrist to confirm that there were no contraindications from other disorders, they were referred to

the physiotherapy department for the hydrotherapy rehabilitation class.

Pain

The intensity of pain was evaluated using a 10-cm visual analog scale (VAS), with anchors at "no pain" and "extreme pain".¹¹

Lumbar motion

Tape measurements (in centimetres) were used for lumbar forward flexion, right and left side bending (or lateral lumbar flexion) by recording the distance between the subject's fingertips to the floor (FTF).^{12,13}

It was also recorded the values of goniometric measurements (in degrees) for right and left side rotational motions.

Analysis

All data analysis was performed with the SPSS, version 14.0, (SPSS Inc., Chicago/IL). Independent *t* tests were used to determine clinical outcome measures changes from baseline to follow up. A level of 0.05 was used in statistical analyses.

Hydrotherapy

Water temperature during hydrotherapy testing ranged from between 35° and 37°C. The temperatures remained constant throughout each testing session, but varied slightly between sessions.

The interventions consisted in water based exercises with a warm up session, followed by stretching and strengthening exercises.

RESULTS

There was no drop out cases. All the patients fulfilled total compliance in exercise sessions. No negative effects were seen.

At follow up, the mean EVA pain score declined from baseline, but the change in pain was not significantly different between groups (fig.1; $p=0,364$). The patients maintained analgesic drug suspension during the study period.

After 6 weeks of hydrotherapy, lumbar motion improved significantly from baseline (fig. 2 and fig.3). With exception of forward flexion (FF; $p=0,376$) and left side bending (LSB; $p=0,074$), the others measurements for lumbar motion showed significant changes. Right side bending (RSB; $p=0,025$), right side rotational motion (RSR; $p=0,014$) and left side rotational motion (LSR; $p=0,006$), increased markedly with treatment.

DISCUSSION

In FBSS, pain and spine disability results from a combination of various pathosociological changes. For this reason, treatment is frequently assorted and broad.

When pain recurs after surgery, we should suspect of reherniation, battered root, epidural fibrosis or arachnoiditis. Longer-term failures may be caused by loss of intervertebral stability or spinal stenosis, either at the previous surgical site or at adjacent levels.¹⁴

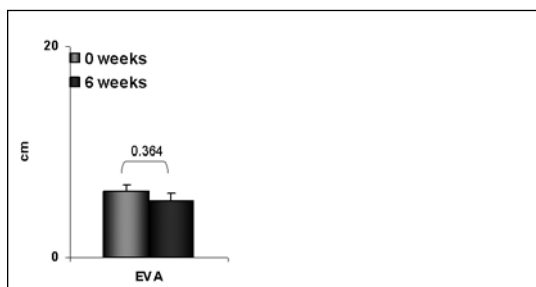


Figure 1
EVA pain score

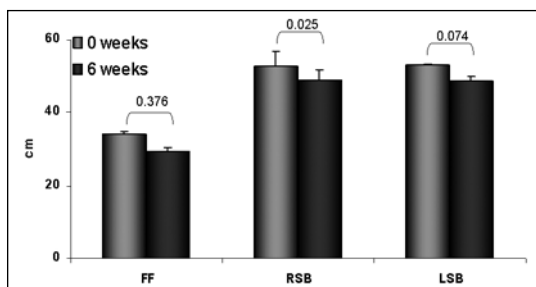


Figure 2
Lumbar motion (FTF): FF – forward flexion RSB/LSB – right and left side bending

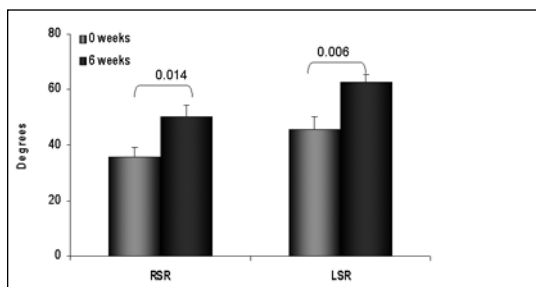


Figure 3
Lumbar motion (goniometry): RSR/LSR – right and left side rotation

Nonetheless, identification of the anatomic source of pain is difficult enough in patients who have had no previous surgery, and is certainly no easier after one or more operations.¹⁵ The recent strategies disagree with a meticulous diagnostic search and prefer a multifactorial and biopsychosocial assessment. That includes anatomy with considerations of behavioral elements ranging from fear avoidance to secondary gain.

In view of the limited evidence of most interventions in reducing pain and improving function in FBSS, it is somewhat challenging to determine which forms of rehabilitation are most effective.

Many controlled studies published on this subject, have demonstrated the benefits of aquatherapy in pain management of back disorders.^{16,17} Although our study failed to find significant difference in the intervention group for improvement in pain, the mean value of EVA score declined and it must be recorded that analgesic medication was suspended through the study. This is, per se, an interesting observation attending the limited effectiveness,

economic costs and lateral effects associated with pharmacologic options. Our findings are consistent with literature, showing that hydrotherapy relieves pain¹⁸⁻²⁰ and reduces the need of analgesic consumption.²¹

Beyond that, aquatherapy is frequently preferred to land-base exercise because it allows effective exercise in patients that have persistent pain with high fear-avoidant behaviour, leading to better exercise tolerance.²² The strengthening of deconditioned muscles also seems to be a major factor. Multiple high-quality studies have found that exercises results in positive outcomes in the treatment of low back pain.²³ The reduced axial loading and the resistance of water during immersion, enables strenuous activity, which will increase the efficacy of muscle strengthening.²⁴ The purpose of strength is to improve alignment, increase endurance of muscles that support the spine, and to retrain normal patterns of muscle activity to achieve better biomechanical efficiency.²⁵ The water based intervention was found to be more effective in improving lumbar motion, which is supported by previous reports.²⁶ Water is a suitable environment to mobilise joints. It has been suggested that the physical properties of water (buoyancy, reduction of gravitational stress, viscosity and hydrostatic pressure), associated with the high water temperature, allow joint movement through a wider range of motion, achieving long term flexibility and stretching of tight areas.^{27,28} These previous findings might explain our results and the limited effect of aquatherapy with cervical spine disease.

In our study almost all measures of lumbar motion improved. Only forward flexion and left side bending, although demonstrating enhanced range of motion, lacked statistical significance.

Although not confirmed in previous data, we have found reluctance from our patients in performing forward flexion exercises, some of them influenced by surgeon recommendations. Another explaining reason for the limited gain observed, can be related with finger to tip floor measure. Used for forward flexion, it has good inter- and intrarater reliability, but is affected by other structures outside the spine (pelvis and hamstrings).²⁹ The results were remarkable to both side rotation and to right side bending. There is no evidence to justify the difference in bilateral side bending, but it appears to be related with the small number of participants in our study. A predominant side of back pain or stiffness, in this particularly group of patients, may have influenced the statistical analysis.

Nevertheless, it appears that hydrotherapy, as well as helping in pain management, is an influential therapeutic modality that improves spine flexibility in patients with FBSS.

CONCLUSION

Failed back surgery syndrome is a condition associated with back pain of long-standing duration that negatively impacts activity and quality of life.

As far as we are aware, the effect of hydrotherapy on this group of patients has not been previously reported.

This study demonstrates that hydrotherapy seems to be a useful strategy for controlling pain and improving spine mobility.

Because of the small number of patients in this study, future studies are needed to replicate and further evaluate these findings.

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