Physiotherapy and osteoporosis: practice behaviors and clinicians’ perceptions—a survey

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Abstract


The purpose of this study was to measure the most common treatment modes used by a random sample of physiotherapists practicing in the province of British Columbia (BC) in the treatment of individuals with osteoporosis. To assess whether physiotherapists in BC have concerns about the use of manual therapy in individuals with osteoporosis, particularly whether physiotherapists have concerns about fracture as a complication of treatment.

This cross-sectional study of 171 physiotherapists in BC used a questionnaire developed by the physiotherapist in the Osteoporosis Program at the BC Women’s Health Centre (a part of the Children’s & Women’s Health Centre of BC).

The response rate (67/171) was 39%. Ninety-seven per cent of respondents reported using strength exercises and postural reeducation, while 45% reported using manual therapy in this population. Ninety-one per cent of respondents reported having concerns about the use of manual therapy. Vertebral fracture and rib fracture were the most commonly reported concerns.

These findings suggest that most physiotherapists practicing in BC, Canada use evidence-based methods (i.e. strength training) when treating individuals with osteoporosis, a large number use manual therapy, and most have concerns about its use. Physiotherapists are most concerned about fractures, in particular vertebral fracture, but injury to other musculoskeletal tissues is also of concern. Studies of safety and effectiveness of manual therapy in this population are needed to guide clinical practice.

1. Introduction

Osteoporosis, characterized by low bone mass and increased fracture risk, is a prevalent condition that affects one in five post-menopausal women (Melton et al., 1992; Melton, 1997). Given the population prevalence, and also the various secondary causes of osteoporosis, it is likely that physiotherapists in all areas of practice see patients with compromised bone health (Sran, 2002). Further, an individual may present to physiotherapy for any number of problems, related or unrelated to osteoporosis. For example, back pain is also common in older adults (Badley and Tennant, 1992; Reynolds et al., 1992) and is associated with reduced mobility, independence, and health related quality of life.
Back pain is also the most common reason for visiting a physiotherapist (Physiotherapy Association of British Columbia (PABC), October 2001) and there are many individuals with both osteoporosis and back pain (Leidig et al., 1990; Patel et al., 1991; Malmros et al., 1998).

Physiotherapists typically use a variety of modes to treat clients with osteoporosis. Pain relief, increased strength, improved posture and improved range of motion are a few common goals of therapy for such individuals (Larsen, 1998; Bennell et al., 2000). Given the effectiveness of manual therapy in various populations (Farrell and Twomey, 1982; Vicenzino et al., 1998; Goodsell et al., 2000; Sterling et al., 2001; Hoving et al., 2002; Niemisto et al., 2003), it seems reasonable that clinicians would consider using such techniques in individuals with osteoporosis. The biological mechanisms underpinning this effectiveness may be related to spinal mobilization stimulating sympathetic nervous system activity (McGuiness et al., 1997; Vicenzino et al., 1998; Sterling et al., 2001) and promoting motor activity (Sterling et al., 2001). For example, emerging evidence suggests that spinal joint mobilization techniques applied to the cervical spine elicit concurrent effects on pain perception, autonomic function, and motor function in patterns that are similar to the patterns of change elicited by stimulation of the periaqueductal grey region of the midbrain (Vicenzino et al., 1998; Sterling et al., 2001; Wright and Sluka, 2001). However, the literature cautions against the use of manual therapy in individuals with osteoporosis (Tobis and Hoehler, 1986; Grieve, 1988; Maitland et al., 2001).

There appears to be agreement amongst leading clinicians that spinal manipulation (high velocity thrust) techniques are contraindicated in individuals with osteoporosis, (Tobis and Hoehler, 1986; Grieve, 1988; Maitland et al., 2001; Ernst, 2003) yet clinical experience (Sran, 2003) and published cases (Haldeman and Rubinstein, 1992) suggest that these techniques are still being used by chiropractors. However, there is concern that even spinal mobilization (low velocity techniques) could cause a fracture, (Sran, 2003) especially in individuals with osteoporosis. Clinical experience indicates that while some colleagues have expressed concern about the safety of manual therapy (including low velocity techniques) other clinicians routinely use manual therapy in older people, a proportion of whom will have osteoporosis.

There are no previous studies of physiotherapists’ perceptions and current practice patterns with respect to the management of individuals with osteoporosis. Although there is vast literature on the effects of mechanical loading on bone (which physiotherapists can use to prescribe appropriate exercises) there are few data on the safety of manual therapy in this population (Ernst, 2003; Sran, 2003; Sran et al., 2004). For these reasons the aims of this study were (1) to measure the most common treatment modes used by a random sample of physiotherapists practicing in the province of British Columbia (BC) for treating individuals with osteoporosis and (2) to assess whether physiotherapists in BC have concerns about the use of manual therapy in individuals with osteoporosis, such as fear of fracture as a complication of treatment.

2. Methods

2.1. Design

This cross-sectional study was approved by the University of British Columbia Clinical Research Ethics Board and the Research Review Committee at Children’s & Women’s Health Centre of BC.

2.2. Materials

The physiotherapist in the Osteoporosis Program at the BC Women’s Health Centre (a part of the Children’s & Women’s Health Centre of BC) developed a brief questionnaire (Appendix A).

2.3. Subjects and procedures

The questionnaire and accompanying cover letter were faxed to a random sample of physiotherapists in the province of BC (Canada). The fax was sent to every fifth member with a fax number, from a list of members of the provincial association. The survey was sent to physiotherapists working in all areas of practice. A total of 208 questionnaires were sent but 37 were not transmitted. Thus, a total of 171 questionnaires were both sent and transmitted. Sixty-seven individuals responded by completing the questionnaire and returning it to the BC Women’s Health Centre by fax or mail within 3 weeks (a due date was specified in the cover letter).

3. Data analysis

The response rate was calculated by dividing the number of respondents by the number of questionnaires that were both sent and transmitted. The number of respondents who

1. used each treatment mode (Appendix A, Question 1),
2. had concerns about the use of manual therapy,
3. had concerns about injury to each of the tissues/regions listed (i.e. vertebral fracture, other fracture, disc injury, muscle injury) (Appendix A, Question 3)
was expressed as a percentage of the total respondents.

4. Results

The response rate (67/171) was 39%. The percentage of all respondents who selected each treatment mode is presented in Fig. 1. Two respondents (3%) reported that they do not treat individuals with osteoporosis. Thirty-nine per cent of respondents reported using treatment modes ‘other’ than those listed. A wide variety of responses were received in the ‘other’ category, including dietary calcium, weight bearing activity, fall prevention education, pain and time management, energy conservation, endurance training, referral to physician for medications, hydrotherapy, support/bracing, and education of personal trainers.

Forty-five per cent of respondents reported using manual therapy in this population (Fig. 1). Ninety-one per cent of respondents reported having concerns about the use of manual therapy (Fig. 2). With the exception of one individual, respondents who reported using manual therapy (in Question 1) also reported concern about its use (in Question 2).

The percentage of respondents concerned about each of the tissues/structures listed is presented in Fig. 3. Vertebral fracture and other fracture were the most commonly reported concerns. Of the respondents who were concerned about ‘other fractures’ (Fig. 3), 13% reported concern about rib fracture. Hip, wrist, and humerus fracture were of concern for a small number of respondents (3%, 1% and 2%, respectively).

5. Discussion

This study presents novel data about current practice behaviors and perceptions of physiotherapists with respect to the management of individuals with osteoporosis in BC, Canada. Most respondents reported concern about the use of manual therapy in this population. Despite this concern, the results suggest that many clinicians (45% of the sample) use manual therapy in this population. Studies suggest that manual therapy can relieve pain (Farrell and Twomey, 1982; Vicenzino et al., 1998; Goodsell et al., 2000; Sterling et al., 2001; Hoving et al., 2002; Niemisto et al., 2003) and improve motor control (Sterling et al., 2001; Jull et al., 2002) so it seems reasonable that physiotherapists would consider the potential benefits of manual therapy for individuals even if they have osteoporosis.
The questionnaire did not specifically state whether the individual was being treated for osteoporosis or an unrelated injury/condition. However, two respondents reported that they do not treat osteoporosis. One stated that ‘we are a hand-only clinic’. This response is of interest as one would speculate that a hand clinic would see some individuals post-wrist fracture, a common sentinel osteoporotic fracture and a strong predictor of future fracture (Mallmin et al., 1993; Cuddihy et al., 1999).

5.1. Treatment modes

As expected, most respondents marked a number of treatment modes. Strength exercises, postural reeducation, flexibility exercises, and ergonomic advice were utilized by a vast majority of respondents (Fig. 1), while balance training was less commonly used yet is also thought to be an important factor in preventing falls and subsequent fractures (Campbell et al., 1997; Malmros et al., 1998; Myers and Briiffa, 2003; Liu-Ambrose et al., 2004). Manual therapy was used by almost half the respondents (Fig. 1) yet few data exist with respect to its safety or efficacy in this population.

5.2. Concern of fracture and/or other tissue injury

The results suggest that physiotherapists are concerned about fracture as a complication of manual therapy treatment, in particular vertebral fracture and rib fracture. Surprisingly, ligament, tendon, and disc injury were also of concern, albeit for a much smaller number of respondents (Fig. 3). This may reflect a lack of data about secondary tissue changes associated with osteoporosis and/or lack of knowledge on the part of physiotherapists with respect to whether or not they should be concerned about these tissues.

5.3. Response rate

The response rate in this study is among the upper range found in surveys of other healthcare professionals (Bhandari et al., 2003; Stone et al., 2003). While some previous studies of physiotherapists report response rates as high as 53% (Robinson et al., 1994) and 65% (Crout et al., 1998), we feel the 39% response rate in our study is acceptable for numerous reasons. First, unlike a previous study (Robinson et al., 1994), we only sent out the questionnaire once (without a follow-up notice) and gave participants only 3 weeks to respond. Of note, some previous studies did not report the length of time allowed for responses (Crout et al., 1998) or did not accurately measure the response rate (Jarski et al., 1990). Next, we only distributed the questionnaire by facsimile, a return-reply envelope was not supplied, and the study included a random sample of all physiotherapists who were members of their professional organization in a specific jurisdiction. Research topic has been shown to affect response rates (de Wit et al., 2001) yet few clinicians treat primarily individuals with osteoporosis. Clinicians may be more motivated to respond to a study about direct-access (Crout et al., 1998) (which more obviously affects their caseload and earning potential) or a questionnaire specific to their area of special interest (Mantle and Versi, 1991; Barry et al., 2003). Some previous studies with higher response rates only involved clinicians in a specific area of practice (Barry et al., 2003) or education (Walker, 1998).

Incentives have also been shown to affect response rates (Halpern et al., 2002) but we did not offer any in this study. Finally, a study of physicians found differences in response rates are unlikely to significantly impact the quality of data collected unless one achieves a response rate significantly above 65% (Schoenman et al., 2003).

5.4. Further research

The brief questionnaire used in this study provides novel information on clinical practice but also has limitations. The frequency of use of manual therapy and clarification of which manual therapy techniques therapists were concerned about are not addressed with this questionnaire. We surveyed physiotherapists working in all areas of practice (public and private workplaces) with or without any specific postgraduate qualifications. A survey of only those with postgraduate qualifications in manual therapy may provide different data and insights.

We did not state whether the client was being treated for osteoporosis or an unrelated condition, and whether they were being treated in an area where osteoporotic fractures commonly occur. While this may have been helpful for the participants, we felt that this information would be leading as we were interested in their knowledge of osteoporosis (i.e. it is a systemic condition mainly affecting trabecular bone) and common sites of osteoporotic fracture (Question 3).

That we used quantitative research alone limits the type of data we could obtain in this study. We met our objectives but investigation of therapists’ beliefs and concerns using qualitative methodology may provide further insight.

6. Clinical implications

These findings suggest that a large percentage of physiotherapists practicing in BC, Canada use evidence-based methods (specifically strength training, Kerr et al.,
1996; Kohrt et al., 1997; Liu-Ambrose et al., 2004) when treating individuals with osteoporosis. Many also use manual therapy in this population and most have concerns about its use. Given the similarities in physiotherapy training across the various provinces in Canada (CUPAC and The Alliance, 1995; CPA, 2000), it is likely that these BC data would generalize nationwide. Further, manual therapy is an internationally practiced and researched treatment (Tobis and Hoehler, 1986; Vicenzino et al., 1998; Goodsell et al., 2000; Maitland et al., 2001; Sterling et al., 2001; Hoving et al., 2002; Kotoulas, 2002; Niemisto et al., 2003; Sran et al., 2004) so these data may even have international relevance. This suggests a need for appropriately designed studies to provide data to address the safety concerns reported in this study.

Physiotherapists are most concerned about fractures, in particular vertebral fracture, but injury to other musculoskeletal tissues is also of concern. Clinical leaders agree that manipulation is contraindicated in this population (Tobis and Hoehler, 1986; Grieve, 1988; Maitland et al., 2001; Ernst, 2003), but consensus on other manual therapy techniques has not been reached. The results of this study suggest that a significant number of physiotherapists use manual therapy in this population. Evidence suggests manual therapy is effective for some conditions, so it seems prudent that physiotherapists would consider using it in this population. However, data are scarce with respect to the safety of manual therapy for individuals with osteoporosis. As clients with osteoporosis could potentially benefit from manual therapy, trials are needed to examine its safety and efficacy in this population.

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Appendix A

1. Which of the following treatment modes would you likely use with an individual with osteoporosis? (Mark all that apply)
   - Strength exercises
   - Balance exercises
   - Flexibility exercises
   - Manual therapy
   - Electrotherapy
   - Ultrasound
   - Laser
   - Postural reeducation
   - Ergonomic advice
   - Other (please specify) ________________________________

2. Do you have any concerns about using manual therapy techniques on individuals with osteoporosis?
   - Yes
   - No

3. If you answered “Yes” to question #2 then:
   Are your concerns related to any of the following? (mark all that apply)
   - Vertebral fracture
   - Other fracture (please specify) ________________________________
   - Ligament injury
   - Tendon injury
   - Disc injury
   - Muscle injury
   - Other (please specify) ________________________________

Thank you for taking the time to fill out this short questionnaire.
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