

Use of high and low velocity cervical manipulative therapy procedures by Australian manipulative physiotherapists

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The use of cervical manipulation presents concerns because of a risk of devastating side effects of trauma to the vertebral artery. Little is known about the frequency of use of cervical manipulation versus passive mobilisation by physiotherapists. A recent national, multi-centre randomised clinical trial of the physiotherapy management of cervicogenic headache provided an opportunity to gain an insight into practices of a sample of manipulative physiotherapists across Australia. The treatment records for the 100 subjects who received only manipulative therapy, or manipulative therapy with exercise as per the trial protocol, were audited. The results revealed that cervical manipulation was used in 20.2% of the 1090 treatments provided to these subjects but cervical joint mobilisation only was used in the vast majority of treatments (77.6%). Nevertheless, 42% of subjects were treated with cervical manipulation at some time. In most instances, manipulation was accompanied by passive mobilisation in the same treatment session. Patients were manipulated on one to six occasions and this occurred predominantly in the latter half of the 12-treatment program. Cervical manipulation was used less frequently in the group who also received exercise. The data suggest that the physiotherapists participating in this study used cervical manipulation selectively and relatively conservatively considering the high use of cervical mobilisation techniques. This may reflect their due regard to safety in the treatment of the cervical region. [Jull G (2002): Use of high and low velocity cervical manipulative therapy procedures by Australian manipulative physiotherapists. *Australian Journal of Physiotherapy* 48: 189-193]

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Introduction

Spinal manipulative therapy is commonly employed in physiotherapy practice in Australia in the treatment of back and neck pain. Both high velocity techniques (manipulation) and low velocity techniques (passive mobilisation) are used (Maitland et al 2000). The use of cervical manipulation presents concerns because of a risk of devastating side effects of trauma to the vertebral artery. Physiotherapists are cognisant of the debate that pervades the literature of whether the benefits of high velocity cervical manipulation far outweigh the risks to justify its use (Assendelf et al 1996, Dabbs and Lauretti 1995, Di Fabio 1999, Haldeman et al 1999, Mann and Refshauge 2001, Powell et al 1993, Rivett and Milburn 1996, Senstad et al 1997). While there is strong support from some quarters for the use of cervical manipulation (Dabbs and Lauretti 1995, Haldeman et al 1999) and some evidence of its effectiveness (Bronfort et al 2001, Nilsson et al 1997), others have called for its cessation due to the risk (Di Fabio 1999, Powell et al 1993).

Little is known of how Australian physiotherapists are reacting to this debate in their clinical practices. One survey, which investigated practices of 44 Victorian manipulative physiotherapists, found that 46% of patients treated for headache (n = 202) received cervical

manipulation (Grant and Niere 2000). It is not known if this reflects practices of a broader group of Australian physiotherapists. A national, multi-centre randomised clinical trial of the physiotherapy management of cervicogenic headache was recently conducted (Jull et al 2002). The trial was not designed to specifically investigate manipulative therapy practices but it provided an opportunity to gain an insight into practices for the upper cervical region in another sample of manipulative physiotherapists located across Australia.

Twenty-six physiotherapists provided manipulative therapy treatment in the trial, which was designed to test the efficacy of manipulative therapy and a specific exercise program for the management of cervicogenic headache. The trial had four treatment arms to answer the question of the effectiveness of manipulative therapy and the specific therapeutic exercise used alone and in combination compared with no physical therapy intervention. Half of the 200 subjects who participated in the trial were randomly allocated to the two groups that received manipulative therapy: Group 1 (manipulative therapy and exercise, n = 49) or Group 2 (manipulative therapy only, n = 51).

The manipulative therapy approach used was that developed by Maitland (Maitland et al 2000), the method

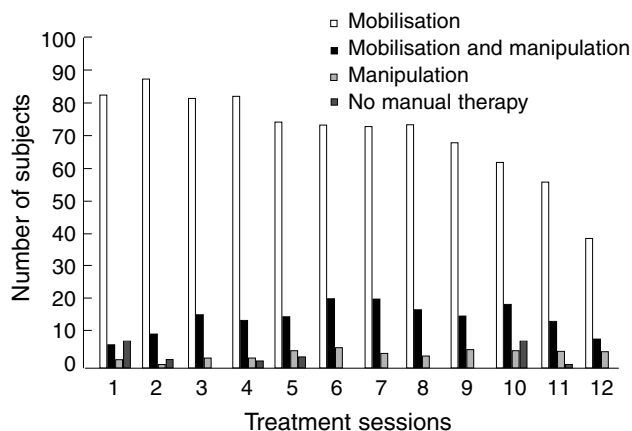


Figure 1. The frequency of use of cervical manipulative therapy procedures over the 12 treatment sessions (n = 100 subjects).

that has underpinned Australian manipulative physiotherapy for more than half a century. The physiotherapists were permitted to select manipulative therapy techniques (cervical passive mobilisation or manipulation) on the basis of their clinical reasoning as in normal clinical practice. The treatment records of the cervicogenic headache patients who received manipulative therapy were analysed to create a profile of the use of passive mobilisation and cervical manipulation techniques.

Methods

Subjects The 200 patients for the trial were recruited either by referral from general medical practitioners or through advertising in five centres located in capital cities in Australia. Subjects were included in the trial if they fulfilled the diagnostic criteria for cervicogenic headache as documented by Sjaastad et al (1998) and were between the ages of 18 and 60 years. Relevant to this report, subjects were not considered if they had any condition which might contra-indicate manipulative therapy (Grieve 1988). On this basis, one patient was not considered for the trial, as the precautionary cervical x-ray revealed a C5-C6 retrolysthesi.

The 26 physiotherapists (14 females and 12 males) providing treatment in the trial all had postgraduate qualifications in manipulative therapy gained from Australian universities and were members of the Musculoskeletal Physiotherapy Australia special group of the Australian Physiotherapy Association. They were experienced clinicians and were invited to participate in the trial on the recommendation of five State Chapters of Musculoskeletal Physiotherapy Australia. Twenty-one of the physiotherapists treated patients allocated to either the combined treatment or manipulative therapy only groups; two treated only patients in the combined treatment group; and three treated only patients allocated to the manipulative therapy group.

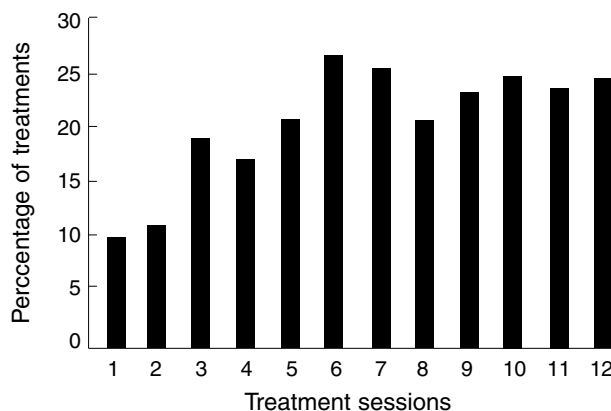


Figure 2. The percentage of treatments which included a high velocity manipulation technique over the 12 sessions.

Manipulative therapy treatment The passive mobilisation and manipulation techniques which the physiotherapists could use were those described by Maitland et al (2000). Cervical manipulation techniques could be employed provided that the clinician was convinced that there were no contraindications to the use of these procedures, the clinical tests for vertebrobasilar insufficiency were negative and the subject provided informed consent as normally required by Australian Physiotherapy Association's Code of Practice (Australian Physiotherapy Association 1988, Magarey et al 2000). As per the trial protocol, subjects received a minimum of eight and a maximum of 12 treatments over the six-week intervention period. Treatment record proformas were provided to all physiotherapists to standardise the information recorded.

Data management Data were analysed descriptively. The treatment records for the 100 subjects who received manipulative therapy (the manipulative therapy and exercise group and the manipulative therapy only group) were examined. The data extracted included the number of subjects who were manipulated during the intervention period and the number of treatments in which subjects received passive mobilisation techniques only, a combination of joint mobilisation and manipulation, or manipulation alone over the possible 12 treatment sessions. The cervical segments manipulated were collated. Records of patients treated by each physiotherapist were examined to determine any tendency for an individual to use, or not use, cervical manipulation. Additionally, the timing and incidence of use of manipulation over the 12 treatments was documented.

Results

The frequency with which subjects received cervical passive mobilisation and/or manipulation techniques over the possible 12 treatment sessions is presented in Figure 1.

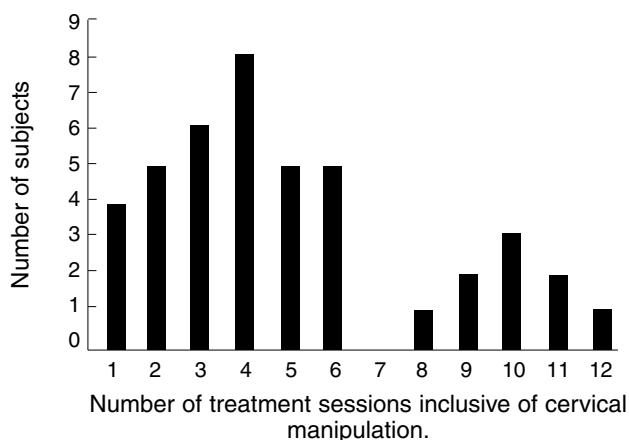


Figure 3. The number of subjects receiving cervical manipulation in one or multiple treatment sessions.

The total number of subjects receiving treatments declined after session eight (the minimum number of treatments as per the trial protocol). Within the 1090 treatment sessions provided to the 100 subjects, physiotherapists chose to use cervical mobilisation procedures only in the majority of treatment sessions (77.6%). In 15.9% of treatments, both mobilisation and manipulation were used within a session and in 4.3%, manipulation only was used. In 2.1% of treatment sessions, physiotherapists treating patients in the manipulative therapy and exercise group elected to use only exercise in a particular session. In total, 220 treatments (20.2%) included cervical manipulation. Just under half of the subjects (42 of the 100 subjects) received a cervical manipulation at some stage in the six week treatment period. Subjects were more likely to receive a cervical manipulation if they were members of the manipulative therapy only group (58.8%), as compared with those who received manipulative therapy and exercise (30.6%).

The frequency of use of cervical manipulation was low (10%) in the initial treatment sessions. This increased to 20-25% over the latter treatment sessions (treatments 5-12) (Figure 2). The number of times a subject was treated with cervical manipulation was analysed for each of the 42 subjects over the 12 possible treatments (Figure 3). Manipulation was used in one to six sessions for the majority of subjects (78.6%). Nevertheless, nine subjects were manipulated during eight or more treatment sessions, with one subject receiving a cervical manipulation during every treatment. Examination of the treatment records of each patient treated by a particular physiotherapist revealed that 12 physiotherapists had treated the cervical spines of some patients with passive mobilisation only while treating others with a combination of passive mobilisation and manipulation. Three physiotherapists used cervical manipulation in the management of each patient treated, while 11 used passive mobilisation only in every treatment.

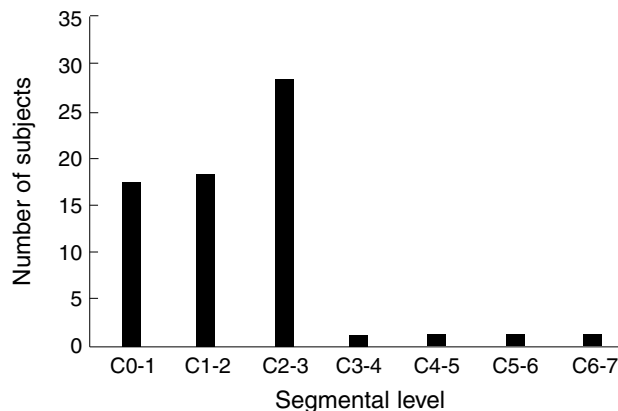


Figure 4. The distribution of cervical segments manipulated.

Figure 4 presents the distribution of cervical segments manipulated at some time over the trial period, noting that for several subjects, a joint could be manipulated in one or more treatment sessions. Consistent with the population of cervicogenic headache subjects, manipulation was confined largely to the upper cervical joints. As a point of clinical interest, 65 of the 100 subjects also received concurrent manipulative therapy treatment to the upper/mid thoracic region. Thoracic manipulation was used in the management of 29 of these subjects, often in combination with mobilisation.

Discussion

A trial investigating the efficacy of physiotherapy management of cervicogenic headache (Jull et al 2002) provided an opportunity to profile the use of cervical manipulative therapy techniques by the 26 Australian manipulative physiotherapists participating in the trial. The physiotherapy profession in Australia recognises that high velocity manipulative thrust techniques to the cervical spine are probably one of the highest risk techniques practised by physiotherapists and have instituted practice guidelines (Australian Physiotherapy Association 1988, Magarey et al 2000, Mann and Refshauge 2001; Rivett and Milburn 1996).

In the trial, both low velocity passive joint mobilisation and high velocity manipulation techniques were delivered to the upper cervical joints. The data indicated that these physiotherapists chose to use passive cervical joint mobilisation only in the vast majority (77.6%) of the 1090 treatments provided (Figure 1). Cervical manipulation was used in 20.2% of treatments, and was delivered to 42% of patients at some time in their management. This proportion of patients receiving cervical manipulation is not dissimilar to that reported by Grant and Niere (2000) for manipulative physiotherapists in Victoria. In most cases when manipulation was used in the treatment of patients in the

trial, passive joint mobilisation was used in conjunction. Therefore, while this current sample of physiotherapists chose the more conservative and purportedly safer passive mobilisation techniques most of the time, manipulation was used in the management of almost half the subjects.

Manipulation appeared to be used selectively rather than routinely, with the majority of patients receiving one to six manipulations over the possible 12 treatment occasions (Figure 3). However, there were nine subjects whose cervical spines were manipulated on eight to 12 occasions. Manipulation is often regarded as a progression of passive mobilisation treatment (Maitland et al 2000). Accordingly, the highest use of manipulation was in the latter seven treatment sessions. Nevertheless, a small number of subjects were manipulated in the first treatment session (Figure 2). The C2-C3 segment was most frequently manipulated (Figure 4), but this reflects the higher incidence of its involvement in the headache sample of the trial. Proportionately it was not manipulated more frequently than other upper cervical segments.

Differences in the frequency of use of cervical mobilisation and manipulation by individual physiotherapists were investigated. Treatment technique selection was at the discretion of the physiotherapist and based on the initial and subsequent patient examinations as in normal clinical practice (Maitland et al 2000). Eleven of the 26 trial physiotherapists used only passive mobilisation in their management of all patients, which could indicate their preference for use of these purportedly safer manipulative therapy techniques. The other 15 physiotherapists used cervical manipulation at some time for some patients, but 12 of these also treated other patients without the use of high velocity manipulation techniques. This would suggest that these physiotherapists used manipulation selectively, rather than routinely.

Subjects were more likely to receive manipulation at some time if they were members of the manipulative therapy only rather than the manipulative therapy plus specific exercise group (58.8% and 30.6% respectively). The majority of physiotherapists treated across intervention groups and there was no evidence that individual preference to use cervical manipulation accounted for its higher use in the manipulative therapy group. In other words, the same physiotherapist who chose not to manipulate a subject in the combined treatment group could choose to manipulate a subject in the manipulative therapy only group. An indication for manipulation is when the joint is "blocked" and not responding to passive mobilisation techniques (Maitland et al 2000). Several studies point to the role of discrete muscle guarding in this palpable loss of segmental motion (Cassidy et al 1992, Nansel et al 1990, Nilsson et al 1996, Thabe 1986). Thabe (1986) demonstrated an immediate reduction in local segmental extensor muscle activity following high velocity manipulations to the upper cervical joints. It is possible that the specific low load exercise which had a focus on re-education of the neck flexor synergy and scapular muscle control helped relax

any extensor muscle activity guarding the cervical joint, thus alleviating the indication for a high velocity manipulation technique. Outcome assessments in the trial revealed that the patients who received the specific exercise regime only demonstrated a reduction in segmental joint pain without the use of manipulative therapy, which might support this suggestion (Jull et al 2002). Further research is necessary to explore this possible mechanism.

No major adverse events were reported with manipulative therapy treatment in the trial but this may be a factor of the comparatively low frequency of use of upper cervical high velocity manipulation rather than a reflection on safe use of manipulation. The trial demonstrated efficacy of manipulative therapy in the management of cervicogenic headache, but in respect of manipulative therapy practices, it was not the goal to answer the question of whether passive mobilisation used alone was as efficacious as passive mobilisation combined with manipulation. Given the predominant use of passive mobilisation in treatment in the trial, there is an urgent need to further research the effects of passive mobilisation used alone versus combined mobilisation and manipulation in the management of cervical spine syndromes. Such a trial would contribute more definitely to the debate on the benefits of use of cervical manipulation over the more conservative techniques of passive joint mobilisation.

Conclusion

The trial of physiotherapy management for cervicogenic headache provided an opportunity to profile the use of manipulative therapy procedures by a sample of Australian manipulative physiotherapists. Just over half of the physiotherapists in this sample were regularly using cervical manipulation as part of the total management of the headache patients (42% of patients), but it appeared to be used selectively (20.2% of all treatment sessions). Passive joint mobilisation techniques were used in the vast majority of treatments. The data suggest that the physiotherapists participating in this study used cervical manipulation selectively and relatively conservatively as shown by the high use of cervical mobilisation techniques. This in part may reflect their due regard to safety in the treatment of the cervical region.

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