Short-term results of physiotherapy in patients with newly diagnosed degenerative cervical spine disease

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INTRODUCTION Degenerative cervical spine diseases are common, and physiotherapy is widely used as an initial form of treatment. We aimed to analyse the effects of the initial sessions of physiotherapy for patients who were newly diagnosed with degenerative cervical spine disorders.

METHODS A prospective series of 30 patients with newly diagnosed degenerative cervical spine disease were referred to our department and followed up for the initial two sessions of physiotherapy. The patients were assessed after each session. Outcome parameters studied included pain using a visual analogue scale (VAS), neck range of movements and activities of daily living (ADL).

RESULTS Our study subjects comprised mainly females (60%) in their fifties (46.7%) who worked as clerks or secretaries (53.3%). There was an improvement in the patients' pain score (VAS) from a median of 8 to 4 after two visits to the physiotherapists. Slight improvement in the neck range of movements was also observed. Marked improvement was seen in ADL, especially in the ability to carry heavy objects.

CONCLUSION Physiotherapy is an effective initial option for patients with newly presented degenerative cervical spine disease. The results of this study can be used to advise patients on the short-term benefits of physiotherapy.

Keywords: degenerative cervical spine disease, physiotherapy
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INTRODUCTION

Degeneration of the cervical spine is common and can present with neck pain, referred pain and radicular pain.[1-3] Physiotherapy is advocated in patients with such conditions as a form of initial conservative management, which may also include other treatment options like acupuncture, chiropractic manipulation and medication. Although satisfactory results have been seen with physiotherapy,[4,5] patients with no improvement may need to consider more invasive options, such as surgery, to treat their cervical spine disease.[6,7]

We aimed to analyse the effects of the initial sessions of physiotherapy on patients who were newly diagnosed with degenerative cervical spine disorders. Knowledge of this would allow us to counsel patients regarding the expected immediate outcome after the initial sessions of physiotherapy, as well as enable us to gauge the extent of recovery after the initial sessions of physiotherapy, so as to decide whether continual physiotherapy remains the most suitable management for such patients.[8]

METHODS

This was a prospective study conducted in a single hospital. In total, we recruited 30 new patients with degenerative cervical spine disease seen at the orthopaedic outpatient clinics during a consecutive five-day period. The presenting symptoms of our patients included neck pain, referred pain and radicular pain. All the patients underwent anteroposterior and true lateral radiography of the cervical spine during the same visit. The radiographs were interpreted by both the duty radiologist and the spine surgeon-in-charge. Patients identified to have degenerative cervical spine disease were given standard neck advice, consisting of proper ergonomics and simple neck exercises. A pictorial brochure was issued to every patient after the contents had been explained to them. They were then referred for physiotherapy within one week from the initial consult and followed up prospectively for the duration of two physiotherapy sessions spaced one week apart. A detailed physical examination was conducted for each patient after the initial two physiotherapy sessions. None of the patients underwent concomitant acupuncture or chiropractic manipulation.

Outcome parameters assessed included pain, neck range of movements and activities of daily living (ADL). For pain assessment, we used a visual analogue scale (VAS) with scores ranging from 0 to 10. A goniometer was used to measure neck movements, including flexion, extension, right and left rotation, and right and left bending. The first author did all the measurements so as to minimise inter-observer differences and to maintain consistency.

A single interviewer-based questionnaire in the English language was employed to assess the deficits in ADL (Appendix). No translator was required for any of the patients. This questionnaire was designed to incorporate six out of the ten sections from the original Owestry Neck Pain Questionnaire.[9] Assessment of pain that was present in the Owestry Neck Pain Questionnaire was separately done using the VAS described above. The questionnaire

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Table I. Demographics of patients with neck pain (n = 30).

Demographic	No. (%)
Age (yrs)	
20–29	1 (3.3)
30–39	3 (10.0)
40–49	6 (20.0)
50–59	14 (46.7)
60–69	5 (16.7)
70–79	1 (3.3)
Gender	
Male	12 (40.0)
Female	18 (60.0)
Occupation	
Clerk or secretary	16 (53.3)
Manual worker	8 (26.7)
Housewife	3 (10.0)
Retiree	3 (10.0)

Table II. Physiotherapeutic treatments.

Physiotherapeutic treatment	No. (%)
Joint mobilisation	29 (96.7)
Dry hot pack	22 (73.3)
Intermittent traction	19 (63.3)
Short-wave therapy	1 (3.3)
Interferential electrical stimulation	1 (3.3)

was piloted on three patients with neck pain prior to the study. It was improved based on patients' feedback for ease of comprehension.

Data entry was performed using a spreadsheet application (Excel 2003, Microsoft Corp, Redmond, WA, USA). Statistical analysis was performed using the Statistical Package for the Social Sciences version 16 (SPSS Inc, Chicago, IL, USA). Means and medians of continuous variables were assessed where appropriate, and categorical variables were studied using chi-square tests. Statistical significance was defined as $p < 0.05$.

RESULTS

A total of 30 patients with neck pain were examined in this study (Table I). The majority were in their fifties (46.7%). There were 12 (40.0%) male and 18 (60.0%) female patients. 16 (53.3%) patients were clerks or secretaries, eight (26.7%) were manual workers, three (10.0%) were housewives and the remaining three (10.0%) were retirees. None of the patients had isolated neck pain. 26 (87.0%) patients had neck pain with associated referred pain and 13 (43.0%) had neck pain with radicular pain. Patients who had radicular symptoms did not have any obvious myotomal weakness. No patient had myelopathy. The mean duration of symptoms prior to presentation was 56 (range 22–85) days.

Among the various physiotherapeutic modalities utilised, manual joint mobilisation performed by a trained physiotherapist was the most common (96.7%). This was followed by application of dry hot pack at the posterior neck (73.3%) and intermittent cervical traction (63.3%). Short-wave therapy (3.3%) and interferential electrical stimulation (3.3%) were the least commonly used modalities (Table II). Patients felt less pain after the second physiotherapy session, with a decrease in pain score from a median of 8 to 4 ($p < 0.0001$). For the neck range of movements, lateral bending was the most commonly affected neck movement among the patients reviewed. This was followed by neck extension, neck rotations and neck flexion (Table III). Improvements after physiotherapy for all neck movements were minimal.

Table III. Outcomes of physiotherapy.

Service	Clinic	After 1 session	After 2 sessions
Pain score* (0–10)	8	8	4
Neck range of movements† (deg)			
Flexion	75.0	80.0	78.3
Extension	42.7	50.0	45.0
Right rotation	73.8	80.0	75.7
Left rotation	74.0	80.0	75.0
Right bending	37.8	45.0	39.2
Left bending	37.5	45.0	38.5
Activities of daily living			
Sleeping	Occasional	-	Never
Carrying heavy things	Light weight	-	Occasional pain on heavy weight
Reading/writing	Must be in a suitable position	-	No problem
Working/doing housework	Can do half the work No discomfort	-	No pain
Driving	No pain	-	No change
Social activities		-	No change

*Data is presented as median †Data is presented as mean

ADL was affected differently in our subjects (Table III). The majority found that sleeping (40%), reading/writing (40%), driving (58%) and social activities (57%) were not affected at all from the start. Improvements were seen after the second session of physiotherapy in the area of sleeping, reading/writing, working/doing housework and carrying heavy things ($p < 0.05$). The most marked improvement was in the area of carrying heavy things (median: 'able to carry light weight' to 'only extra pain when carrying objects'). No statistical significance was found for driving and social activities. In addition, statistical analysis did not show any correlation between age, gender, occupation and improvement in pain and performance of ADL.

DISCUSSION

Many studies have shown the benefits of various physiotherapeutic modalities in treating degenerative cervical spine disease.[5,6,10] In fact, physiotherapy is a widely accepted mainstay treatment for patients with degenerative cervical spine disease.[11] Several studies have also shown the effectiveness of a multimodal approach combining physiotherapy with oral anti-inflammatory medication and patient education; however, the pathophysiology behind its usefulness remains unclear.[12,13]

The physiotherapeutic modalities offered by our institution include manual joint mobilisation, application of dry hot pack at the back of the neck, intermittent cervical traction, short-wave therapy and interferential stimulation treatment. As a general guide,

all symptomatic patients with degenerative cervical spine disease and neck pain receive joint mobilisation, intermittent traction and dry hot pack. Patients who describe a deep-seated pain in the neck are given short-wave therapy and/or interferential treatment. In this study, short-wave therapy and interferential stimulation were given to one patient each.

Within two sessions of physiotherapy, all our patients experienced significant pain relief. Although minimal improvements were made in terms of neck range of movements, the analysis of ADL showed improvements in the patient's ability to carry heavy loads, work and perform housework. Such information not only confirms the short-term benefits of physiotherapy but also suggests that more improvement may be achieved with further therapy. We feel that patients with newly diagnosed degenerative cervical spine disease should continue to undergo physiotherapy, and that good short-term results can be assured in the majority. However, the long-term benefits of physiotherapy remain unaddressed by this study, and the decision to consider a multimodal approach or more invasive procedures (e.g. surgery) should be discussed with the patient in greater detail.[14]

The obvious limitations of our study are the small number of patients and the short duration of follow-up. Therefore, the study population may not be representative of our local population, and hence, we would not be able to comment on the longer-term benefits of physiotherapy. Furthermore, the use of a new questionnaire for our local population with components extracted from the Owestry Neck Pain Questionnaire makes our results non-comparable with other studies, although conclusions can be drawn from individual components of the questionnaire. Nevertheless, further studies are required in order to evaluate the validity of this questionnaire. The severity of disease at the time of presentation in our patients is unknown. This could potentially affect a patient's response to physiotherapy.

A significant proportion of patients with degenerative cervical spine disorder also seek alternative treatments such as chiropractic manipulation and acupuncture. These treatment modalities were not addressed by our study. Chiropractic manipulation aims to widen the canal space, drop the intra-discal pressure and increase the disc height to relieve pain. An early study has shown that chiropractic manipulation may be a safe and helpful modality for treatment of cervical disc herniation.[15] Acupuncture is increasingly being used in various clinical conditions, including degenerative cervical disorder.[16] There is evidence to suggest that acupuncture relieves pain immediately after treatment, and this was maintained at the short-term follow-up.[17,18]

Despite the limitations, our study shows that physiotherapy is an effective means of conservative treatment for patients with degenerative cervical spine disease. For first-time presenters of degenerative cervical spine disease, the initial sessions of physiotherapy provide significant pain relief, minimal improvement in neck range of movements and allow better functioning in the areas of carrying heavy loads, sleeping, working/doing housework and reading/writing. The long-term benefits of physiotherapy were not analysed in this study and could not be commented upon.

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APPENDIX

QUESTIONNAIRE

Activities of Daily Living

1. Sleeping
   - ☐ My sleep is never affected.
   - ☐ My sleep is occasionally affected.
   - ☐ My sleep is regularly affected.
   - ☐ I can only sleep < 5 hrs a day.
   - ☐ I can only sleep < 2 hrs a day.

2. Carrying heavy things
   - ☐ I have no pain when carrying heavy things.
   - ☐ I have extra pain when carrying heavy things.
   - ☐ I can only carry medium-weight objects.
   - ☐ I can only carry light-weight objects.
   - ☐ I cannot carry any objects.

3. Reading and writing
   - ☐ I have no problems with reading and writing.
   - ☐ I must be in a suitable position when reading and writing.
   - ☐ I have extra pain when reading and writing.
   - ☐ I have to stop reading and writing earlier.
   - ☐ I cannot read or write.

4. Working and doing housework
   - ☐ I have no pain when working and doing housework.
   - ☐ I have extra pain when working and doing housework.
   - ☐ I can do half the work and housework.
   - ☐ I can do quarter of the work and housework.
   - ☐ I cannot work or do housework.

5. Driving
   - ☐ I have no discomfort when driving.
   - ☐ I drive with discomfort.
   - ☐ My driving is limited occasionally.
   - ☐ My driving is limited frequently.
   - ☐ I cannot drive.

6. Social activities
   - ☐ I have no pain during social activities.
   - ☐ I perform my social activities with pain.
   - ☐ My social activities are restricted, but I can still go out.
   - ☐ My social activities are restricted to home.
   - ☐ I have no social life.