

Acute Treatment of Whiplash Neck Sprain Injuries

A Randomized Trial of Treatment During the First 14 Days After a Car Accident

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Study Design. A single-blinded, randomized treatment study with a follow-up period of 6 months.

Objective. To study the long-term consequences of whiplash neck sprain injuries in patients treated with two different regimes during the first 14 days after the car accident. Patients in the first group were encouraged to act as usual, *i.e.*, continue to engage in their normal, pre-injury activities; that group was compared with another group of patients who were given time off from work and who were immobilized using a soft neck collar. The end point of the comparison was the evaluation of subjective symptoms 6 months after the accident.

Summary of Background Data. Few randomized treatment studies have been performed to evaluate the clinical outcome for patients with neck sprain.

Method. Patients who participated in the study were recruited from the Emergency Clinic at the University Hospital in Trondheim, Norway. The study group included 201 patients (47% of the study group) with neck sprain that resulted from a car accident. Neck and shoulder movements and subjective symptoms, which were assessed using several different measurements, were assessed during the follow-up period.

Results. There was a significant reduction of symptoms from the time of intake to 24 weeks after the treatment period in both groups. There was a significantly better outcome for the act-as-usual group in terms of subjective symptoms, including pain localization, pain during daily activities, neck stiffness, memory, and concentration, and in terms of visual analog scale measurements of neck pain and headache.

Conclusions. The outcome was better for patients who were encouraged to continue engaging in their normal, pre-injury activities as usual than for patients who took sick leave from work and who were immobilized during the first 14 days after the neck sprain injury. [Key words: acute treatment, neck sprain injury, soft neck collar, whiplash] *Spine* 1998;23:25-31

The term "whiplash," used to describe an injury mechanism of sudden hyperextension followed by hyperflexion of the neck, was first suggested by Crowe at a research meeting in 1928.¹⁰ The injury mechanism is commonly seen in sport and traffic accidents. When no objective signs of damage to the cervical spine on radiography and no clinical signs of nerve root damage are found, the injury is termed whiplash injury or neck sprain injury.^{9,11,14,16} A significant proportion of the patients have long-lasting symptoms, and some are disabled for long periods. The most common symptoms are neck pain, neck stiffness, headache, shoulder pain, back pain, and difficulties with concentration and memory. Dizziness, buzzing in the ears, insomnia, depression, and anxiety also are reported. The first scientific papers about whiplash and neck sprain injuries were published in the early 1950s.^{3,7,8,20} Since then, more than 10,000 studies focusing on whiplash and neck sprain injuries have been published.¹⁸ Authors of these studies have recommended various types of acute treatment with analgesics, sedatives, antihistamines, nonsteroid anti-inflammatory drugs, antidepressive drugs, codeine, muscle relaxants, and local anesthetic injections as well as local heat and ice treatment, neck collar immobilization, ultrasound, and physiotherapy.^{2,3,5,9,19,20} In chronic cases, surgery and low-energy, high-frequency pulsed electromagnetic therapy have been suggested.^{1,6} However, none of these studies were randomized treatment studies. The authors of a randomized study designed to examine the effect of intracutaneous sterile water injection concluded that patients with neck sprain injuries had less pain after the sterile water injection.⁴

An important consideration is whether application of early mobilization after neck sprain injuries is beneficial. Pennie¹⁵ published a prospective, but not randomized, treatment study consisting of two treatment groups with a follow-up period of 2 years. One group received early neck traction and physiotherapy, while the other group was told to rest in a neck collar and was given instructions for mobilization. The study found that collars molded in slight flexion provided the best outcome.

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However, two randomized intervention studies found that early training resulted in better outcome.^{12,13} The study of Mealy et al¹² evaluated the outcome of two treatment groups. In one group patients received daily training in neck movements, and in the other group patients were given soft collars and were instructed to rest for 14 days before mobilization. In another study, McKinney et al¹³ evaluated the outcome of three treatment groups. One group received instructions to perform self-training of neck movements, another group received supervised physiotherapy, and the third group received general instruction to rest for 10–14 days before mobilization. Each patient was fitted with a soft collar and given an analgesic. The group that performed self-training improved significantly faster than the other groups, as measured by the number of recovered patients at every month.

The aim of the current study was to compare the clinical outcome of two groups of patients; each group received a different intervention during the first 14 days after neck sprain injuries occurred: instruction to carry on as usual or immobilization with a soft collar and sick leave. In light of the finding in previous studies that early training is successful, both groups were instructed in self-training of the neck from the first day of treatment.^{12,13}

■ Methods

Patients. In this study, 201 patients, including 81 men (40%) and 120 women (60%), with neck sprain injury caused by car accident were enrolled into a randomized treatment study at the Emergency Clinic, University Hospital in Trondheim, Norway. The Trondheim region has a population of approximately 190,000 inhabitants.

To be included in the study, patients had to be 18–70 years of age, had to have been injured in private-car accidents with reported material damage, and in accidents that had been rear-end, side- or head-on collisions. Patients who had been in bus or large-vehicle accidents were excluded. Similarly, patients whose permanent residence was far from the city of Trondheim were excluded. In accordance with the definition of whiplash and neck sprain injuries, patients with radiographically disclosed vertebral fractures, clinical signs of nerve root compression, and simultaneous concussion or other head trauma also were excluded.^{9,11,14,16}

Selection. The Emergency Clinic in Trondheim is the main accident and emergency department in Sør-Trøndelag county. The 201 patients were recruited between September 1994 and December 1995. They constituted 47% of the eligible neck sprain patients who visited the Emergency Clinic in the same time period.

The patients were recruited at their first consultation at the Emergency Clinic. Twenty-three of the 201 patients did not attend the consultation performed 6 months after the accident and were considered “drop-outs” (12 men and 11 women). Nine of the drop-outs had been randomly assigned to the immobilized group, and 14 had been randomly assigned to the act-as-usual group.

Additionally, 16 questionnaires were incomplete at intake,

10 after 14 days and 15 after 6 weeks. A total of 178 patients (89%) took part in the consultation performed 6 months after the accident (mean age, 36.5 ± 12.4 years), whereas 138 patients correctly completed all questionnaires.

Nearly all patients were covered by insurance. However, the follow-up period of 6 months was too short for any claims beyond the cost of medical treatment and physiotherapy.

Treatment Groups. All patients received instructions for self-training of the neck beginning on the first day of treatment and a 5-day prescription for nonsteroidal anti-inflammatory by the on-duty physician at the Emergency Clinic.

The patients were randomly assigned to an act-as-usual group or an immobilized group. In the act-as-usual group patients were instructed to act as usual and received no sick leave or collar. Patients in the immobilized group received 14 days of sick leave and were immobilized with a soft neck collar for 14 days. They were instructed to alternate use of the soft collar during the day with 2 hours on and 2 hours off and to use it continuously during the night.

Investigations and Measurement of Symptoms. All investigations at intake were performed before the random assignment of patients to the two groups. The patients underwent radiographic investigation and completed a questionnaire to assess demographic data, information concerning the car accidents, and previous and present symptoms.

Follow-up consultations at 14 days and 6 months after the accidents were performed by the first author (GB), who was blind to the random assignments to the treatment groups. Only one patient disclosed her treatment group by wearing a neck collar at the consultation performed 14 days after the accident. At these follow-up consultations the patients were asked about subjective symptoms that they related to the neck sprain injury. All patients underwent a neurologic investigation and a test of neck and shoulder movements.

A questionnaire was sent to the patients 6 weeks after the accident, asking them to describe their symptoms.

The neurologic investigation included examinations of cranial nerves and upper extremity dermatomes; tests of power in the interossei, the humeral biceps, and triceps; tests of reflexes of the biceps, triceps, and brachioradialis; the Romberg test; and the finger–nose test of cerebellar function.

The neck movements were measured using an instrument similar to a Cybex, Model DEI-320. This instrument was placed on the top of the patient's head, while a perpendicular pendulum functioned as an indicator on a scale of 180 degrees. The instrument was filled with syrup to make inertia for smooth movements. The neck movements measured were extension, flexion, lateral flexion, and rotation.

Shoulder movements were investigated with the patient's hand on her back either over the shoulder (test one) or under the shoulder (test two). Shoulder mobility was measured as the distance from the ipsilateral thumb to the contralateral lower medial edge of scapula.

Patients were examined at intake and at follow-up examinations performed 2 weeks, 6 weeks, and 6 months after the accident for a wide range of outcome measures. The primary subjective symptoms assessed were neck pain, neck stiffness, and headache. Other symptoms assessed were shoulder stiffness, back pain, chest pain, difficulties with memory, difficulties with concentration, buzzing in the ears, dizziness, nausea, di-

inished vision, insomnia, consumption of analgesics, depression, and anxiety.

Intensity of subjective symptoms at intake and at 14 days, 6 weeks, and 6 months after the accident was rated on a scale of six categories from 0 (none) to 5 (maximum).

In addition, a visual analogue scale (VAS) was used to assess headache and neck pain at intake and 6 weeks and 6 months after the accident.

Patients indicated the local area of their pain using hatch marks on a drawing of a man at 14 days and 6 months after the accidents. For quantification, the drawing was divided into 10 predefined regions. Each region accounted for 10%. Regions included: the dorsal side of the head, neck, shoulder and intracapsular region (each region divided into a left and a right side) and the forehead and lower back (one region). Any hatching in each region was measured as 10%.

Pain during common daily activities was assessed at 14 days and at 6 months after the accident using a scale of five categories: no pain, some pain, severe pain, nearly unbearable pain, and unbearable pain. Pain was registered separately for each of 18 daily activities: walking, sitting, bending, standing, lying down, lifting, running, climbing stairs, carrying, pushing and pulling, car driving, dressing, reading, watching television, performing house work, gardening, performing sports activities, and working.

A subjective feeling of global improvement was assessed at the follow-up consultation performed 6 months after the accident using a scale of three categories: improved, same as before, and worse (that is compared with the feeling reported at the previous consultation at 14 days after the accident).

At the consultation performed 6 months after the accident the patients also were asked whether they were currently on sick leave, had been on previous sick leave beyond the treatment regime of 14 days, and if they had sought alternative treatment from other medical or nonmedical sources.

Statistics. The subjective symptoms measured on the 0–5 scale were reduced according to a principal component analysis for each assessment point, with varimax rotation into three factors according to factor loadings. The symptoms of neck pain, neck stiffness, headache, and shoulder stiffness loaded consistently on a pain factor; difficulties with concentration and memory difficulties loaded consistently on an attention factor; and buzzing in the ear consistently loaded as an independent factor.

Student *t* tests were used to analyze differences between the treatment groups at intake for the pain factor, the attention factor, and the factor buzzing in the ears. Student *t* tests also were used to examine group differences; to compare the symptom factors for pain, attention, and buzzing in the ears at intake; and to compare end-point measurements between the 138 patients with measured symptoms at all assessment points and the 40 patients with incomplete questionnaires at the assessments performed at 14 days or 6 weeks after the accident.

The chi-square test was used to assess group differences in the distribution of gender, civil status, employment status, level of education, type of accident, and use of sick leave beyond the treatment regime.

Analyses of variance with repeated measures was used to analyze the development of the score of pain distribution and pain during daily activities. Through this method differences in "time," "treatment," and "treatment by time" were analyzed. Time measured combined temporal changes in symptom devel-

opment. Treatment measured significant group differences, when scores from all measurement points were added together. Treatment by time measured whether there were significant differences between the treatment groups, when a group difference at each measurement point differed from one point to another.

Through analysis of covariance (ANCOVA) with repeated measures the differences in symptom development were corrected by using the baseline variables as covariates. Baseline variables were present for the variables of headache, neck pain, and neck stiffness; the symptom factors for pain, attention, and buzzing in the ears; and VAS for neck pain and headache.

The effect of reported alternative treatment during the follow-up period also was corrected for by using ANCOVA with repeated measures with the baseline variables as covariates.

■ Results

Demographic Data

There were no statistically significant differences between the two treatment groups in age, gender, civil status, employment status, level of education, or type of accident (Table 1). There were also no statistically significant differences in the reported frequency of symptoms before the accident, nor on any of the outcome measures assessed at intake.

Main symptoms

At intake, 15% of the total patients reported severe headache, 21% reported severe neck pain, and 22% reported severe neck stiffness. After 6 months, 17% of the patients reported severe headache, 13% reported severe neck pain, and 9% reported severe neck stiffness (Table 2).

Symptoms Combined into the Pain Factor

For the pain factor, ANCOVA with repeated measures and baseline scores as a covariate yielded no significant differences between the act-as-usual group and the immobilized group for the effect of treatment or for treatment by time, but there was significantly less pain in both groups at 6 months than at intake ($F[2, 250] = 14.90$; $P < 0.001$; Table 3).

Symptoms Combined into the Attention Factor

For the attention factor, ANCOVA with repeated measures and with the baseline measurement as covariate yielded no significant difference between the two treatment groups for treatment or for time, but there was a significant difference between groups for treatment by time ($F[2,246] = 3.32$; $P < 0.05$). The act-as-usual group had significantly less problems with attention and memory than the immobilized group (Table 3).

Buzzing in the Ears

For the independent factor buzzing in the ears, ANCOVA with repeated measures and with the baseline measurement as covariate yielded no significant differences between the treatment groups for treatment, time, or treatment by time (Table 3).

Table 1. Demographic and Clinical Variables Registered at Intake

	Act as Usual (no. (%) (n = 82)		Immobilized (no. (%) (n = 96)	
Age (yr) (mean ± SD)	37.2 ± 13.2		36.0 ± 11.8	
Gender				
Men	32	(39)	37	(39)
Women	50	(61)	59	(61)
Employment				
Full or part time work	61	(75)	70	(73)
Student or military	10	(12)	10	(10)
Housewives	3	(4)	3	(3)
Unemployed	3	(4)	8	(8)
Social Security	4	(5)	5	(5)
Education				
Primary school	10	(13)	14	(15)
Secondary school	20	(25)	30	(31)
Technical high school	16	(20)	28	(29)
University	34	(43)	22	(23)
Civil status				
Single	33	(41)	37	(39)
Couple	47	(58)	58	(61)
Type of accident				
Rear end	50	(65)	60	(65)
Hit from the front	10	(13)	17	(18)
Hit from side or other mechanism	17	(22)	16	(17)
Registered with "daily symptoms" or sick leave caused by symptoms prior to the accident				
Headache	0	(0)	6	(7)
Neck pain	2	(2)	5	(6)
Neck stiffness	5	(5)	5	(6)

Pain Distribution

For pain distribution, ANOVA with repeated measures yielded a significant effect for treatment ($F[1,175] = 8.31; P < 0.01$) and for time ($F[1,175] = 23.78; P < 0.001$), but no significant difference for treatment by time. Patients in the act-as-usual group used fewer hatch marks on the pain drawing, indicating smaller areas of pain, than patients in the immobilized group (Table 4).

Table 2. Main Symptoms at Intake and 6 Months Later for Both Groups

	At Intake (n = 162)		Six mo After the Accident (n = 178)	
	Not Bothered (%)	Severe Symptoms (%)	Not Bothered (%)	Severe Symptoms (%)
Headache				
Act as usual	27	10	59	12
Immobilized	27	20	41	21
Neck pain				
Act as usual	14	17	48	11
Immobilized	15	26	34	15
Neck stiffness				
Act as usual	13	19	46	7
Immobilized	10	24	31	10

Not bothered = defined as 0 on the scale from 0 to 5; Severe symptoms = defined as > 3 on the scale from 0 to 5.

Pain During Daily Activities

For pain during daily activities, ANOVA with repeated measures yielded no significant effect for treatment or for time, but there was a significant difference for treatment by time ($F[1,174] = 4.70; P < 0.05$). Patients in the act-as-usual group had less pain than patients in the immobilized group (Table 4).

Neck and Shoulder Movements

There were no differences between the treatment groups in any of the neck or shoulder movements measured on follow-up examination at 14 days and at 6 months after the accident (Table 4).

Visual Analog Scale of Headache and Neck Pain

For VAS headache and VAS neck pain, ANCOVA with repeated measures and with the baseline measurement as covariate yielded no significant differences for treatment or for time, but there were significant differences for treatment by time for both headache ($F[1, 139] = 11.01; P < 0.01$) and neck pain ($F[1,140] = 4.33; P < 0.05$). For headache and neck pain the act-as-usual group had significantly less pain than the immobilized group (Table 5).

Intensity of Main Symptoms Measured on a Scale from 0-5

For intensity of symptoms, ANCOVA with repeated measures and with the baseline measurement as covariate yielded significant differences for time for headache, neck pain, and neck stiffness. There were significantly fewer symptoms 6 months after the accident than at intake for headache ($F[2,260] = 4.80; P < 0.01$), neck pain ($F[2,260] = 7.13; P < 0.01$), and neck stiffness ($F[2,262] = 11.41; P < 0.001$). There were no significant differences in treatment for any of the variables (headache, neck pain, and neck stiffness), but for neck stiffness there was significant difference for treatment by time ($F[2,262] = 4.98; P < 0.01$). Patients in the act-as-usual group had significantly less intense neck stiffness than patients in the immobilized group (Table 6).

Use of Sick Leave Beyond the Treatment Regime of the Study

The two treatment groups did not differ in the amount of sick leave used by the time of the follow-up evaluation 6 months after the accident (chi-square test; Table 7). For this comparison sick leave was measured from 14 days until 6 months after the accident. Only two patients in each treatment group still were not working at all (100% sick leave) 6 months after the accident. Five patients in the immobilized treatment group and six patients in the act-as-usual group had 50% sick leave.

Subjective Feeling of Global Improvement

For subjective feeling of global improvement 6 months after the accident, there was no significant difference between the two treatment groups (chi-square test). In both groups approximately 20% of patients reported that

Table 3. Development of the Symptom Factors During the 6 Months of Follow-up

	At Intake (n = 162)	14 days (n = 168)	6 wk (n = 163)	6 mo (n = 178)
Pain factor				
Scale (0-5)				
Act as usual	1.99 ± 0.13	1.57 ± 0.05	1.98 ± 0.14	1.30 ± 0.14
Immobilized	2.10 ± 0.12	1.77 ± 0.07	2.01 ± 0.13	1.63 ± 0.12
Attention factor				
Scale (0-5)				
Act as usual	0.19 ± 0.06	0.32 ± 0.09	0.51 ± 0.11	0.34 ± 0.09
Immobilized	0.24 ± 0.06	0.34 ± 0.09	0.58 ± 0.10	0.61 ± 0.12
Buzzing in the ears				
Scale (0-5)				
Act as usual	0.24 ± 0.10	0.11 ± 0.05	0.36 ± 0.10	0.15 ± 0.06
Immobilized	0.33 ± 0.10	0.20 ± 0.07	0.36 ± 0.13	0.14 ± 0.06

Note: Values are mean ± standard error of the mean.

they felt worse at 6 months after the accident than at 14 days after the accident (Table 7).

Correction for Other Treatment

As many as 79 of the patients reported that they had sought other treatment, 47 from the immobilization group and 32 from the act-as-usual group. The most common alternative treatment was physiotherapy (71 patients). When correcting for additional alternative treatment received during the treatment phase or follow-up period in the statistical analysis, results remained the same.

Table 4. Development of Pain Distribution, Pain During Daily Activities, and Neck and Shoulder Movements

	14 days After the Accident	6 mo After the Accident
Pain distribution		
Act as usual	29.9 ± 20.0	20.7 ± 19.4
Immobilized	35.6 ± 20.7	29.9 ± 19.6
Pain during daily activities (scale 0-4) (all 18 activities pooled)		
Act as usual	1.41 ± 0.44	1.34 ± 0.47
Immobilized	1.38 ± 0.39	1.48 ± 0.45
Neck movements (°)		
Flexion + extension		
Act as usual	96.0 ± 23.6	105.0 ± 23.4
Immobilized	93.2 ± 24.1	103.2 ± 21.7
Side flexion (left + right)		
Act as usual	73.8 ± 19.7	83.3 ± 19.2
Immobilized	73.8 ± 19.4	80.2 ± 16.2
Rotation (left + right)		
Act as usual	140.1 ± 35.4	153.1 ± 31.0
Immobilized	140.3 ± 35.4	153.9 ± 34.9
Shoulder movements (cm)		
Test 1 (left + right)		
Act as usual	32.6 ± 9.4	32.2 ± 9.0
Immobilized	32.6 ± 9.2	32.0 ± 8.1
Test 2 (left + right)		
Act as usual	0.2 ± 13.6	-0.4 ± 13.3
Immobilized	-0.2 ± 12.3	0.9 ± 11.8

Note: Values are mean ± standard deviation. For neck movements, the higher the number, the better the movement. For shoulder movements, the lower the number, the better the movement.

When the 138 patients who completed all questionnaires were compared with the 40 patients who had incomplete data, there were no significant differences for any of the measured symptoms at the evaluation performed 6 months after the accident.

Discussion

The group of patients who were instructed to act as usual had a better outcome for several variables 6 months after the accident than the group of patients who took sick leave and used a neck collar. The outcome of subjective symptoms that were rated on a scale from 0 to 5 was significantly better for patients in the act-as-usual group than for patients in the immobilized group, especially for neck stiffness and pain localization. Patients in the act-as-usual group also had better outcomes in terms of headache and neck pain, as measured on a VAS, and concentration, memory and pain during daily activities. Only the first 14 days after the accident were used for intervention. It is therefore worth emphasizing that even with such a short treatment period, significant treatment effects can be achieved. However, one should also keep in mind that at 6 months after the accident more than 10% of the patients in the act-as-usual group had severe symptoms.

Table 5. Development of VAS Through the 6 Month Follow-up Period

	At Intake (n = 178)	6 wk (n = 163)	6 mo (n = 178)
VAS neck pain			
Scale (0-100)			
Act as usual	33.0 ± 2.5	32.9 ± 3.9	26.6 ± 2.6
Immobilized	38.1 ± 2.6	29.7 ± 2.7	31.1 ± 3.2
VAS headache			
Scale (0-100)			
Act as usual	24.2 ± 2.7	28.2 ± 3.6	21.4 ± 3.4
Immobilized	33.3 ± 3.0	27.8 ± 3.0	33.2 ± 3.2

Note: Values are mean ± standard error of the mean.

Table 6. Development of Intensity of Main Symptoms

	At Intake (n = 162)	14 days (n = 168)	6 wk (n = 163)	6 mo (n = 178)
Headache (0-5)				
Act as usual	1.70 ± 0.17	1.49 ± 0.18	1.92 ± 0.20	1.26 ± 0.20
Immobilized	2.10 ± 0.18	1.81 ± 0.19	1.94 ± 0.17	1.84 ± 0.19
Neck pain (0-5)				
Act as usual	2.29 ± 0.17	1.77 ± 0.21	2.18 ± 0.20	1.45 ± 0.17
Immobilized	2.56 ± 0.17	1.96 ± 0.14	2.15 ± 0.15	1.78 ± 0.16
Neck stiffness (0-5)				
Act as usual	2.41 ± 0.17	1.87 ± 0.18	2.37 ± 0.15	1.39 ± 0.16
Immobilized	2.60 ± 0.16	1.92 ± 0.14	2.10 ± 0.19	1.71 ± 0.14

Note: Values are mean ± standard error of the mean.

Based on the results of this study, the authors can only speculate on the explanations for the observed differences in outcome. The variables for which there were significant differences were all variables of subjective symptoms, whereas there were no significant differences for variables of objective data such as neck mobility and duration of sick leave. This finding suggests that the significant differences of outcome may result from psychological factors. Immobilization treatment with a neck collar and sick leave may cause the patient to focus more attention on the accident and the resulting symptoms and therefore may cause the patient to worry about long-lasting problems. In contrast, the instruction to act as usual after an accident is generally a comforting message for the patient to receive after an injury.

Radanov et al¹⁹ found that 2 years after a neck sprain injury there were no significant differences in the reporting of symptoms between the symptomatic patients who were able to work and the symptomatic patients who were disabled.

The authors of this study suggest that patients with long-lasting symptoms after whiplash and neck sprain injuries in many cases are able to continue engaging in normal life activity, and that instruction to act as usual at the first consultation may encourage this attitude.

Table 7. Sick Leave Beyond Treatment Regimen and Subjective Feeling of Improvement

	6 mo	
	Act as usual (n = 82)	Immobilized (n = 96)
No. (%) of persons with sick leave beyond the first 14 days from the treatment regimen	24 (33)	21 (22)
No. (%) of persons with sick leave at the end-point consultation	8 (10)	7 (7)
50%	6 (7)	5 (5)
100%	2 (2)	2 (2)
Global improvement		
More symptoms	17 (21)	21 (22)
As before	11 (13)	14 (15)
Less symptoms	54 (66)	60 (63)

Improved outcome after early mobilization for patients with neck sprain also has been reported in other studies.^{12,13} Mealy et al¹² compared two treatment groups; the patients in one group were immobilized with soft collars during the first 2 weeks, whereas patients in the other group received ice treatment during the first 24 hours and early mobilization with daily guided training of neck movements. The group with early mobilization had the best outcome. McKinney et al¹³ compared three different treatment groups: one in which patients were treated with immobilization during the first 10-14 days, one in which patients received early physiotherapy, and one in which patients received instructions for self-training of the neck. Another interesting observation in the latter study was that there was no significant difference in outcome between those who received early physiotherapy and those who were immobilized, although the results were somewhat confusing because of differences among the groups in the duration of treatment.

In the present study the authors wanted to simplify the study protocol by using treatment intervention during only the first 14 days after the accident and by trying to avoid complications with complete immobilization. All patients in both groups received the same neck training program and were instructed to perform this training from the first day.

In conclusion, the authors of this study found that patients who were instructed to continue engaging in their normal activities (act as usual) after neck sprain injury had a better outcome than patients who took sick leave from work and who were immobilized with soft neck collars during the first 14 days after the accident.

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