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cervical pain and mobilization

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Zusammenfassung

Zervikaler Schmerz und Mobilisation

Spezifische (= lokalisierte) Mobilisation schmerzhafter und steifer Halswirbelsäulensegmente mit typischem "endfeel" (Schlußwiderstand der passiven Bewegung) hat gute Behandlungsresultate ergeben. Schmerzlinderung, d. h. mindestens zwei Einheiten der 9-gradigen Symptomskala, war statistisch signifikant größer als in den zwei Kontrollgruppen. Auch die Mobilität war ein wenig vergrößert. Es gab keine signifikante Korrelation zwischen Schmerzlinderung und Vergrößerung der Mobilität. Untersuchung und Behandlung waren hauptsächlich osteopathisch. Eine Kontrollgruppe bekam Salizylat (Premaspin Lääke). Eine zweite bekam Salizylat, spezielle Information ("Nackenschule") während drei Stunden und oberflächliche, wahrscheinlich wirkungslose Behandlung ("mock therapy"). Die therapeutischen Resultate waren dieselben in den zwei Kontrollgruppen. Persönlichkeitstests nach sozialen, ökonomischen und wirtschaftlichen Verhältnissen zeigten keine Unterschiede zwischen den drei Gruppen.

Schlüsselwörter

Behandlung zervikaler Schmerzen – vertebrale Mobilisation – Schmerz, statistische Auswertung.

Only a few back pain conditions can be explained by proved pathological findings such as herniated disks, fractured vertebrae, neoplasms, osteomyelitis. But the majority of back patients with unknown pathology undoubtedly has pain. For these patients studies of function disturbances followed by function treatment are advocated as one part of the complete therapy.

Earlier Experiences

The importance of selecting the right patients for evaluation of functional treatment is obvious. However, reported results have been controversial. The problem is discussed i. a. by Paris (14) and Schiötz (in (3)). One major obstacle in back research is the difficulty in finding the origin of pain. With osteopathic technique as background, Brodin (2) described a useful classification of back patients as follows :

I. *Patients with objective signs of nerve root compression*

II. *Patients without objective signs of nerve root compression*

A) Pain is generated in a mobile segment with reduced mobility

B) Pain is generated in a mobile segment with normal or hypernormal mobility

The need to mobilize stiff and painful joints is discussed by i. a. Brodin (2, 3), Gutmann (9), Kaltenborn (10), Krausová *et al.* (11), Lewit (12), Maigne (13), Stoddard (16), and Zukschwerdt *et al.* (17). The results of cervical mobilization in comparison with other therapies (controls) are not reported. But many authors have found positive effects of mobilization e. g. de Cuyper and Driessens (6), Decroux *et al.* (8), Krausová *et al.* (11).

Even if the symptom-producing pathology is obscure the physician must form his own opinion on

which he can act in order to get reasonably good results. The author's clinical experience in dealing with these problems was the basis for this study. Anatomical, physiological and biomechanical facts as well as information from particularly Cyriax (7), Gutmann (9), Kaltenborn (10), Lewit (12), Maigne (13), and Stoddard (16) were also important.

Some fundamental points of view should be stressed :

1. Any joint including the spine, healthy or injured will be painful (or more painful) if it is loaded in an extreme position. If the mobility is restricted the chance that extreme positions are reached and loaded are greater than in a normal joint (see 5).
2. Restricted mobility in one mobile segment of the spine can cause increased demands on mobility in neighbouring segments causing abnormally frequent extreme-position-loading also in those.
3. Because of points 1 and 2 it is necessary to examine the mobility of each mobile segment separately.

The Problems

1. Do patients with restricted mobility (manual diagnosis) and pain in cervical mobile segments benefit from mobilizing manual therapy ?
2. Is there any relationship between reduction of pain and increase of the total cervical spine mobility ?

The technique of manual examination comprises special studies of both mobility and endfeel, i. e. the resistance at the end of the passive movement of each mobile segment from occiput-atlas down to Th_2. The patient must be relaxed and should immediately report when pain appears. For further details see Lewit (12) and Stoddard (16).

Material

Patients were chosen from among those who were referred from several units of the Karolinska Hospital. Therefore, the incidence of the studied type of cervical pain cannot be described. But it appears to be considerable.

For the study, 71 patients were accepted. They were all under 60 years of age (Table 1). Their condition was evaluated to be suitable for manual therapy, i. e. it was possible by means of manual technique to observe restricted movement in the pain-producing segment. Thus, cases with pain from segments with normal or increased mobility were excluded. The case history consisted of a list of 71 questions and the somatic findings included an additional 156 details.

Eight patients left the study a short time after the randomization and the grouping (see below). The reasons were the following : Acute abdominal pain-1 ; acute cerebral (?) disease-1 ; vacation and infection-1 ; acute pain in several joints-1, incapable of following planned treatment-4 (for details concerning groups of patients see "Results").

Method

1. The patients were examined and accepted by the author. A special form was filled in containing the case history and the clinical state.
2. In envelopes with consecutive number 1-71, a slip of paper marked 1, 2 or 3 was placed after a random list. For the accepted patient the predetermined appropriate envelope was opened and the therapy group was determined to be group 1 or 2 or 3.
3. Each patient was informed by the author. The nature of the disease was described as not dangerous

Table 1

Age, sex and length of history

Start of first pain period years	Age groups (years)						Total	
	27-39		40-49		50-59			
	M	F	M	F	M	F	M	F
< 1/2	0	1	6	5	4	7	10	13
1/2-2	0	4	2	0	3	3	5	7
2-5	1	2	0	4	1	5	2	11
> 5	1	1	1	6	2	4	4	11
Total	2	8	9	15	10	19	21	42

and with good prognosis. Patients in group 1 were told that they should try a new type of drug, known to reduce pain most efficiently. Patients in group 2 had the same information as those in group 1. In addition they were told that they would have some special information, to help ease their pain, and also treatment by a skilled physiotherapist. Patients in group 3 had the same information as those in group 2.

4. Group 1 obtained a preparation of salicylate, Premaspin (Lääke) 1.5 g + 0.5 g + 0.5 g daily for 3 weeks.

Group 2 had Premaspin (Lääke), information and mock therapy.

Group 3 had Premaspin (Lääke), information by the same physiotherapist as group 2 and specific manual mobilization of the actual mobile segments in the cervical spine by a different physiotherapist.

5. Pain was recorded after a linear scale ((1) the scale was modified later). Number one meant no pain, three slight pain, five moderate pain, seven intense pain and nine unbearable pain. The patient estimated the pain by a figure on the scale. Each week the patient reported the actual pain level. A change of two steps was regarded as a real change. The pain figure was recorded by a licensed physiotherapist L. S. who was not informed of the patient's therapy group.

6. The method of recording the mobility of the cervical spine was described by Brodin *et al.* (4). For all the patients the load on the extreme positions was kept low in order not to produce pain. The same load was used for the regular weekly measurements. The total sum of the mobility in the coronal, sagittal and transverse plane was recorded each week by the licensed physiotherapist, L. S. A change of the total mobility of more than 30 degrees was looked upon as a real change. The mobility was recorded before the therapy started as well as after one, two and three weeks of therapy and finally one week after therapy finished.

7. Patients in group 2 and 3 were given information on back problems, especially cervical problems. The first hour dealt with the anatomy of the cervical spine and its patho-physiology. Special emphasis was laid on mechanical problems particularly on the pain producing extreme positions of the spine.

The second hour consisted of the same items as the first hour but more expanded. Biomechanical problems and relaxation were especially studied. The third hour was devoted to practical problems, such as lifting, carrying and relaxation as well as different orthoses for the cervical spine. During each hour the patients were instructed to do some special movements, with the aim of bettering muscular control of the cervical spine and the shoulder girdle.

This information was given by a specially trained licensed physiotherapist, M. S.

8. The manual therapy for group 2 was also given by the physiotherapist, M. S. It comprised superficial massage, electric stimulation and slight relaxing traction. It was given three times a week for three weeks.

9. The "specific" therapy of patients in group 3 was given by a trained physiotherapist, M. F. It comprised relaxation techniques such as superficial heat, soft tissue treatment and slight traction, i. e. about the same therapy as given to patients in group 2 by M. S. A real mobilizing technique comprised passive movements directed to the actual mobile segment(s) mainly according to Stoddard (16). No manipulative thrusts were given, which means that passive movements were carried out slowly to the extreme positions of the joints under slight traction. All movements were made without pain, i. e. in painfree directions. Three treatments were given each week for a 3 week period. If patients were painfree before that time, the treatment was stopped earlier.

10. The social conditions were recorded in a special form by a social worker.

11. Eysenck personality inventory test, Cesarec-Marke personality scheme and R 10 F were used by experienced assistants.

Results

History

A. *For the First Pain Period (Table 1)*: The duration of the *actual* pain period was less than 2 months for 28 patients with the number being about the same in all three groups.

Twelve patients who during the last 4 years had been medically certified as having suffered from back pain for a period of three or more months were also found to be about equally distributed among the groups. In group 3 there were 11 patients with three or more periods of back pain, in group 1 eight and in group 2 four.

Approximately an equal number of patients in the three groups gave the following informations:

- number and distribution of irradiating pains, (head, arms, between scapulae)

– effect of tried therapy (better by drugs 21%, traction 11% and immobilization 16%, no effect of traction 13% or massage 6%)
– use of tobacco (more than 20 cigarettes a day in 8%) and alcohol (more than one liter brandy or equivalent a month in 19%)
– social satisfaction
– satisfaction with life (in general)
– occurrence of pain outside work
– working capacity (own opinion)
– size of circle of friends
– feeling of stress and strain in neck and arms in and outside work
– type of work
– stress in work
– income per year
– basic education

It was not possible to evaluate the significance of the time it took to get to work. In group 1 eleven patients had to travel less than 30 minutes, in group 2 twelve and in group 3 eighteen.

Initial pain level was about the same in the three groups (4.65-4.74 on the 9 point graded scale). The limit for group 1 and 2 was 3-7, for group 3 it was 3-8.

B. *Somatic Findings before Treatment* : Tender spots with increased consistency in the muscle ("myosis") were frequent, 57% in right trapezius, 48% in left trapezius, 46% in left infraspinatus, 40% in left levator scap. etc. down to 13% in right sternocleidomastoideus. In the three groups 80-90% of the patients showed these signs of pain.

Weak elbow flexor reflex was recorded twice on the right side and once on the left. Weak elbow extensor reflex three times on the right and four times on the left side.

Decreased muscle power was found in the flexors of the right elbow in 11 patients and in the left elbow in six. This was also the case for the abductors of right and left thumb and abductors of dig. V for four patients in each case. Decreased superficial sensibility in the ulnar region of the hand was noticed in 4 patients.

Manual examination revealed the same distribution of segments with decreased mobility in the three groups. The segments C6-Th2 were affected in about 90% in all groups but pain could be produced in every segment. No difference between the three groups could be seen concerning number and localization of painful segments.

C. *Social, Economical, Vocational and Personality Studies Revealed no Difference between the Three Groups* : Thus, patients with signs of anxiety, depression and hysteria were found in the three groups in about the same incidence.

D. *Therapeutic Results* : I. Effect on pain was evaluated in two ways :

a) *The pain level* in the three groups after treatment (see Table 2). Group 3 differs significantly ($p < 0.05$) from the other groups when the figures are tested for trend in table of contingents.

Table 2

Pain recording one week after final treatment

	Group 1 ($n = 23$)	Group 2 ($n = 17$)	Group 3 ($n = 23$)
No pain	5 (22%)	2 (12%)	11 (48%)
Slight pain	9 (39%)	8 (47%)	8 (35%)
Moderate pain	4 (17%)	5 (30%)	3 (13%)
Increased pain	5 (22%)	2 (12%)	1 (4%)

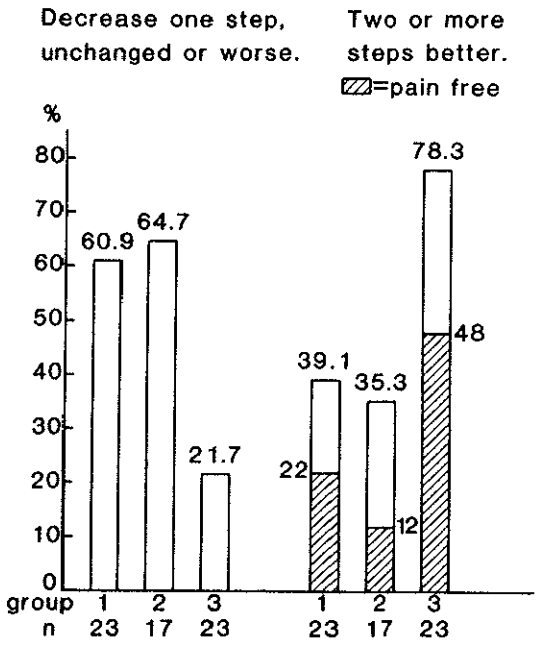

Fig. 1
Pain changes from start to one week after last treatment. Striped areas mean freedom of pain. Group 1 and 2 are controls, group 3 mobilized patients.

b) *The decrease of pain* in the three groups after treatment (Fig. 1). The result for group 3 differs significantly from the results for the other two

groups at the conclusion of the treatment as well as one week after treatment.

II. Effect on mobility (Table 3): The figures for increased mobility are significantly ($p < 0.001$) higher for group 3, in relation to groups 2 and 3 at the final treatment. One week later the significance was considerably less ($p < 0.1$).

Table 3

Total increase of mobility at the final treatment

Group Increase	1 ($n = 23$)	2 ($n = 17$)	3 ($n = 23$)	Total
$< 30°$	16	11	8	35
$> 30°$	7	6	15	28

III. Some findings of special interest: Two patients with blocked vertebrae (C_2-C_4 and C_7-Th_1 respectively) belonged to group 3. They reported unchanged pain one week after the last treatment. X-ray examination showed degenerative changes in the different segments with the highest figures C_5-C_6 with 57% and C_6-C_7 with 48%.

In eleven cases, advanced (seven) or moderately advanced (four) degeneration was demonstrated by X-ray examination. Four of these patients belonged to group 1: one was better, and three were unchanged after treatment. One patient in group 2 did not benefit from the treatment. Six patients in group 3 were all better, four painfree. In 17 patients no pathology could be observed.

Twelve patients were medically certified as having back pain for more than 3 months. Four of them belonged to group 3 and all were better, the other eight were not.

An obvious fact was the good tolerance of Premaspin (Lääke) in group 3, where none of the 23 patients reported discomfort. Of the remaining 40 patients 25% had discomfort, (10 patients) usually small complaints. Totally 16% of 63 patients had some discomfort.

Discussion of the Results

The three groups were homogeneous as regards sex, age and history as well as social, economical, vocational and personality conditions. The pronounced roentgenological findings were more numerous in the mobilized group.

The technique used to evaluate the mobility of single mobile segments as well as to mobilize them cannot be described in detail. Demonstration and individual teaching would be necessary in that respect. The main components of the technique are of osteopathic origin.

The group of patients receiving painfree mobilizing treatment in tender mobile segments with reduced mobility showed statistically better results concerning pain. The unavoidable placebo effects on pain was considered when the study was planned. The patients of group 2 were given the same program as those of group 3 in all respects except the exactly directed treatment of the actual mobile segment. The patients of the two groups were meant to feel that they had the same treatment. That these groups were treated by 2 separate physiotherapists was regarded as a possible error, which it was not possible to evaluate. It was, on the other hand, reasonable to suppose, that it would be a greater mistake if the group 3 therapist, soon conscious of the good effect of the specific mobilization, were to have given unspecific treatment in group 2.

A remarkable fact was the strikingly similar result in group 2 and group 1. It seemed as if the placebo effect depended on regular visits and tests including the general positive attitude of the examiners. The information of anatomy and biomechanics as well as the non-specific manual contact between patients and therapists had no evident effect.

A condition for the mobilizing treatment was the manually recorded restricted mobility of the painful mobile segment. The mobility of the cervical spine as a whole was also measured in an attempt to give some idea of the mobility changes during the treatment period. The measurements were performed with very low load on the extreme positions and if possible without producing pain and increased muscle tension. The recorded figures are not necessarily as exact as figures for painfree cervical spines. However, recorded figures indicate that mobility increased more in patients who reported decreased pain.

This short-time study does not give information about prognosis. After the final treatment, information was collected concerning sick-listing for back pain during the next three years. All 3 patientgroups showed figures higher than the mean value for back pain in Sweden. This fact is not surprising. Successful symptomatic pain treatment can presumably give

permanent relief for some patients. But for many of them the treatment should be extended, particularly with more detailed teaching to avoid pain during work and spare time. After the mobilization, it is important to learn how to avoid loading of the joints in the extreme positions and to maintain the increased mobility. However, it is most valuable to know that cervical pain patients can be helped to improve temporarily by simple manual technique as a first step towards complete treatment.

Summary

Specific i. e. localized mobilization of painful cervical mobile segments with restricted mobility and typical end feel (final resistance to passive movement), produced good therapeutic results. Reduction of pain, i. e. minimum two steps of a nine-graded symptom scale, was greater than in the two control groups. Also the mobility increased a little. No significant correlation between reduction of pain and increased mobility was found. Examination and treatment was mainly of osteopathic character. One control group received salicylate (Premaspin Lääke) and another had salicylate, special information ("cervical school") for three hours and mock manual therapy. The therapeutic results were the same in these two groups. Neither personality tests nor the social, economical and vocational conditions revealed any differences between the three groups.

Key words

Cervical pain treatment – Vertebral mobilization – Pain record.

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