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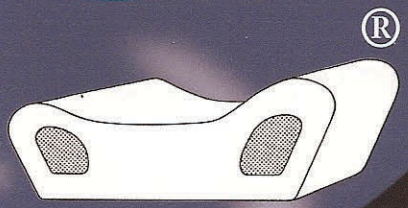

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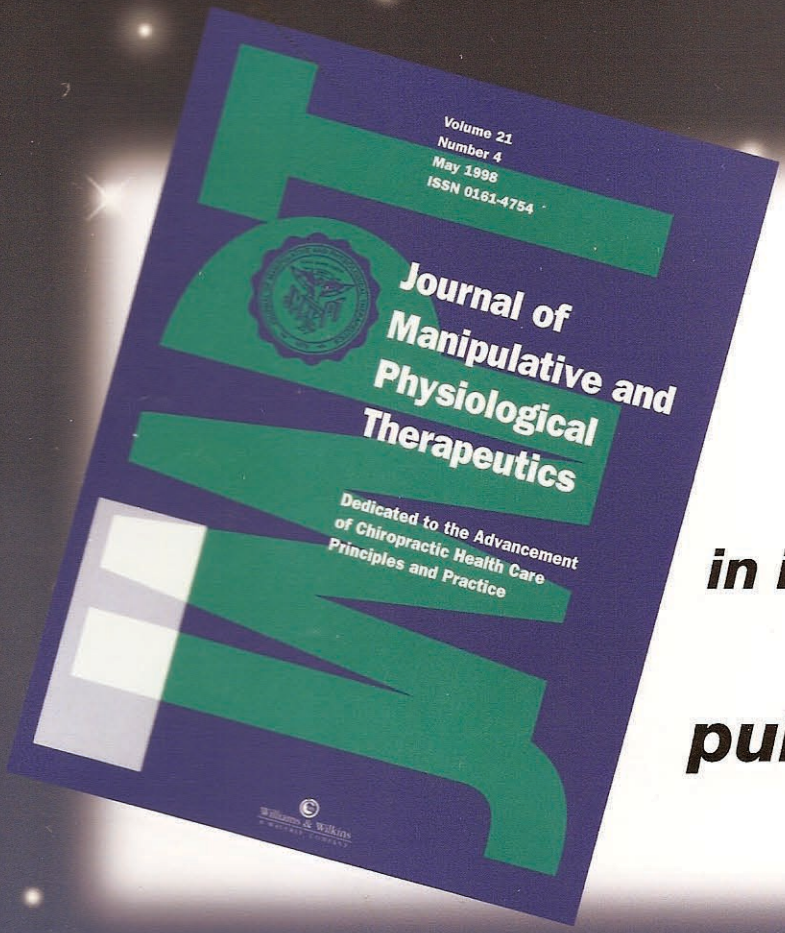

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Neck Support pillows: A Comparative Study

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VOLUME 21 NUMBER 4

JMPT

MAY 1998

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Neck Support Pillows: A Comparative Study

Liselott Persson[1] *and Ulrich Moritz, M.D., Ph.D.*[2]

ABSTRACT

Background: Special neck support pillows claiming to improve rest and reduce neck pain are currently being advertised.

Objective: To test whether neck pillows have any positive effect on neck pain and quality of sleep compared with usual pillows and, if so, to find the optimal characteristics of such a pillow.

Methods: Thirty-seven hospital employees and 18 neck patients were asked to test six neck pillows with different shapes and consistency randomly over the course of 3 wk, to grade them according to comfort and to describe the characteristics of an ideal pillow.

Results: Thirty-six of 55 persons found the pillows positively affected sleep and 27 of 42 found that they positively affected neck pain. The ideal pillow should be soft and not too high, should provide neck support and should be allergy-tested and washable. The pillow that included two firmer supporting cores for neck lordosis received the best rating.

Conclusion: A neck pillow with good shape and consistency and with firm support for cervical lordosis can be recommended as a part of treatment for neck pain. (J Manipulative Physiol Ther 1998; 21:237–40).

Key Indexing Terms: Neck Pain; Treatment

INTRODUCTION

Muscular tension and neck pain are common complaints both at work and during night rest (1, 2). Many people wake up with a stiff neck; some experience more neck pain at night. It is generally accepted that a good mattress is a must for a good night's rest, especially for people with back problems. Similarly, various pillows designed to create a relaxed resting position for the neck joints and muscles are sometimes recommended for neck pain sufferers. A number of special neck support pillows advertised as improving night rest have appeared on the market recently. The theoretical framework behind these pillows is that they can help maintain natural cervical lordosis and that people will feel comfortable with proper neck support. Presumably, when one is lying in a lateral position, a firm pillow with an appropriate height would support the head sufficiently.

Some authors and researchers recommend a neck pillow to relieve pressure on the neck during sleep after a whiplash injury (3) and for patients with cervical disk disease (4). Some recommend an arrangement of three pillows to create neck flexion and internal shoulder rotation to relieve pain in patients with cervical radiculopathy (5). Medicinal pillows with herbs had a long history in traditional Chinese medicine for the treatment of neck pain (6). Several chiropractors, physiotherapists and surgeons recommend supporting neck pillows in their practices, but no study had been performed to find out whether some pillows create a relaxed position better than others or if different products had different effects.

The purpose of this study was to test whether individuals perceive special neck pillows to be better than their own pillows, to test whether neck pillows affect pain and sleep and, if possible, to identify the best type of pillow to recommend as part of an overall treatment for patients with neck problems.

METHODS

Pillows of various designs and characteristics available on the Scandinavian market in 1996 were included in the study.

- Pillow 1 was cut in polyether with two neck shapes and heights, with the same firmness throughout the pillow. The pillow came with a thin wedge for height adjustment (Figure 1).
- Pillow 2 was molded to shape in polyurethane, with the same firmness throughout the pillow, and was available in three different sizes (Figure 2).
- Pillow 3 was cut in a soft polyurethane, enclosing two firmer supporting cores with one low and one high side (Figure 3)
- Pillow 4 was thinner than the others, with a polyurethane core, and covered with soft padding (Figure 4).
- Pillow 5 was larger than the others and, unlike the other pillows, was shaped in three sections (Figure 5).
- Pillow 6 was made of relatively inelastic foam plastic to

[1] Department of Neurosurgery, Lund University Hospital, Sweden.
[2] Physical Therapy, Lund University Hospital, Sweden.
Submit reprint requests to: Liselott Persson, Department of Neurosurgery, University Hospital, S-221 85 Lund, Sweden.
Paper submitted April 30, 1997; in revised form, June 16, 1997.
This study was carried out with support from Dr. Einar Björkelund's research foundation.

which the weight and warmth of the head gave a certain plasticity and moldability (Figure 6).

Six samples of six different makes of pillows with different shapes and consistencies were purchased for the study. If the make of pillow was available in several sizes, the medium size or the most common size recommended by the manufacturer was bought. The pillows were numbered 1 through 6 on the reverse side. The product and manufacturer names were removed.

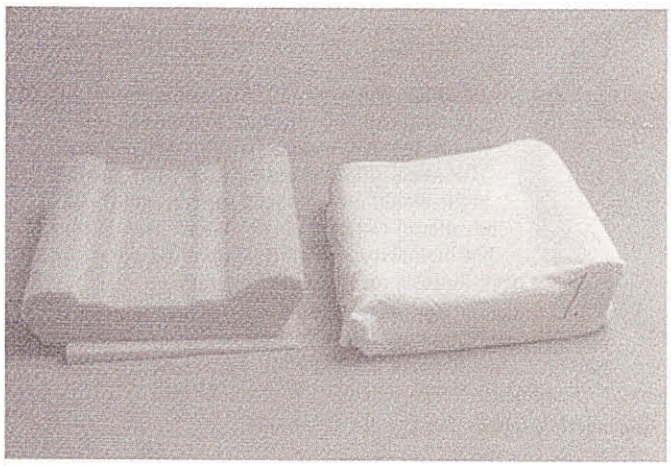

Fig. 1 *Pillow 1.*

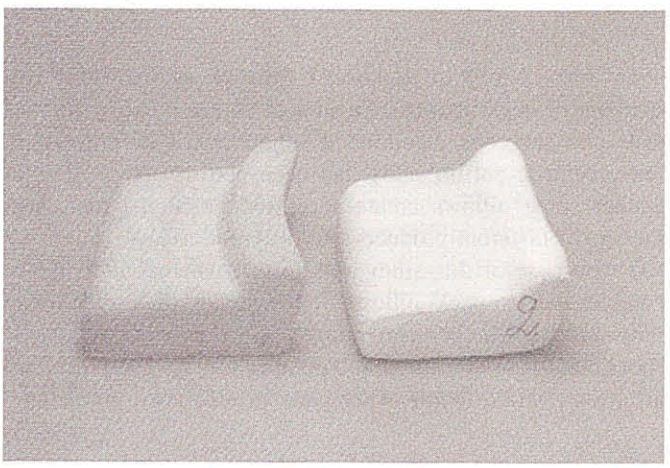

Fig. 2 *Pillow 2.*

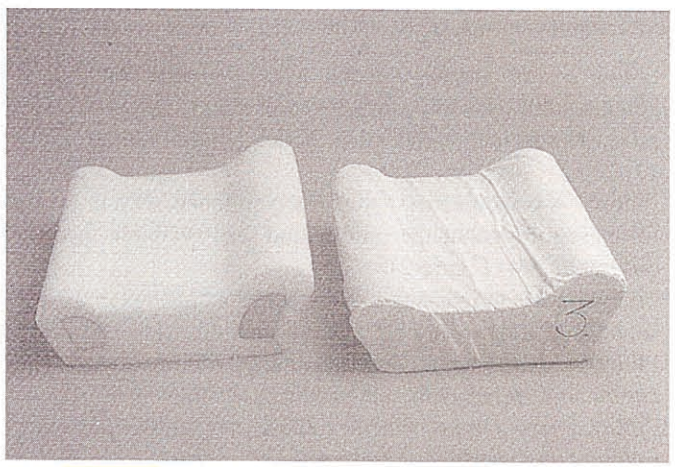

Fig. 3 *Pillow 3.*

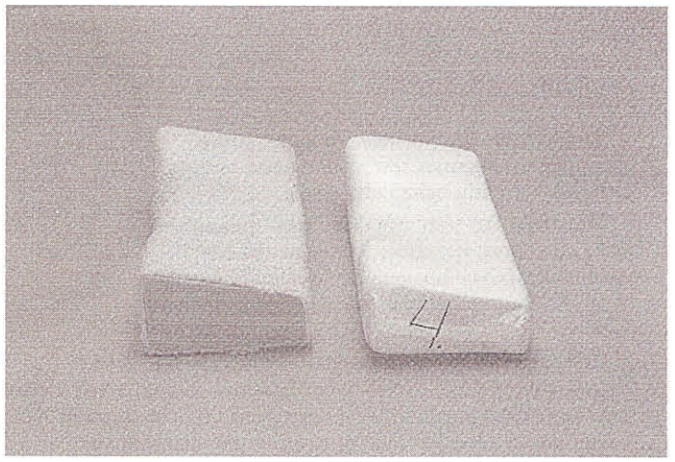

Fig. 4 *Pillow 4.*

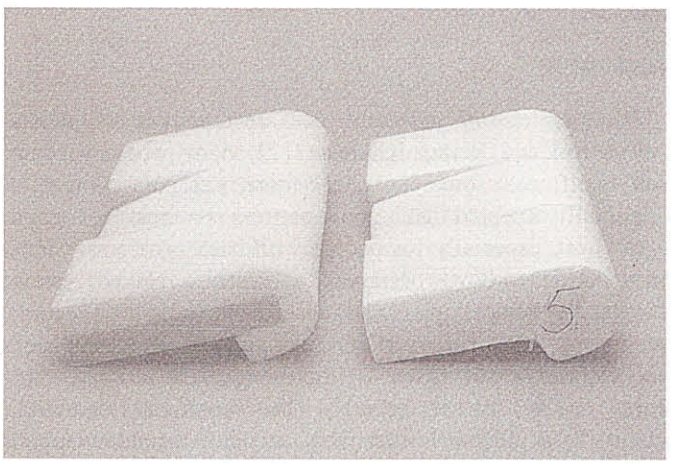

Fig. 5 *Pillow 5.*

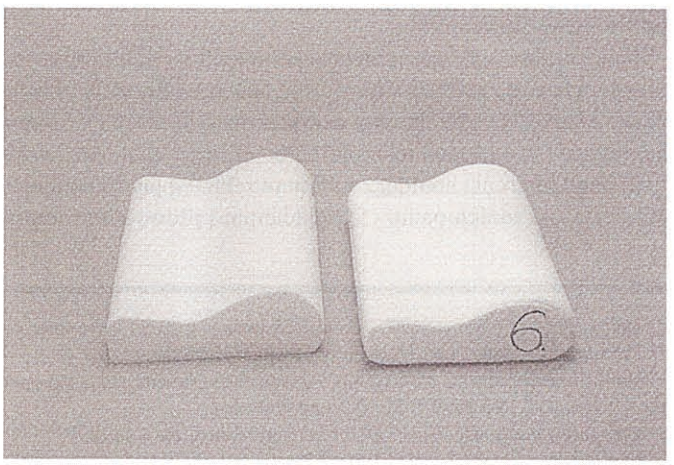

Fig. 6 *Pillow 6.*

Subjects

Fifty-five persons were asked to participate in the study. Thirty-seven were hospital employees, 12 were outpatients who had symptoms of muscular pain in the neck and six were patients who had received surgery with anterior cervical discectomy (7) for cervical disk herniation 1 wk earlier at the Neurosurgical department. The mean age was 38 yr (range 20–55), and 38 of the 55 persons were women. The subjects had normal weight and height, and none was registered sick except the patients who had received surgery.

The subjects were instructed by the physiotherapist to randomly test all the pillows over the course of 3 wk and to test each pillow for at least 3 consecutive nights. They were asked to grade the pillows according to which they found most comfortable, next most comfortable, etc., as well as marking which pillow was the worst. During the test period, the subjects had to complete a questionnaire on neck problems, sleeping habits and the effects of the pillows on quality of sleep, neck tension and pain. The questionnaire was to be returned to the physiotherapist with the neck pillows after the evaluation.

Statistical Methods

For statistical calculations, the pillow that was found most comfortable was given 6 points, the next best was given 5 points, and so on. Nonparametric tests were chosen. For comparison of neck pillow scores, Friedman's two-way analysis of variance was used. If the result was significant, the Wilcoxon matched-pair test was performed for pairwise comparisons. The sign tests and χ^2 test were used for group comparison; outcomes were considered significant at $p \leq .05$.

RESULTS

Of the 55 subjects, 42 stated in the questionnaire that they had periodic neck and shoulder problems. Of these, 24 were hospital employees who claimed to have periodic symptoms of neck stiffness, muscular tension and neck pain. Twenty-five of the testers had received some form of treatment for their necks (physiotherapy, 18; acupuncture, three; massage, two; treatment from a chiropractor, one and treatment from a naprapath, one).

Twenty-seven of the 42 people who mentioned problems in the neck and shoulders believed that their neck tension and pain were reduced by the neck pillows ($p < .05$). Of these 27 persons, 19 (70%) graded pillow 3 as the best. Pillows 1 and 6 came in second, with 11% of the people ranking them the highest (three persons each). Pillows 2 and 5 both scored 3% (representing one vote each).

Nineteen women and 8 men stated that they had periodic sleeping difficulties. Twenty-three of these people (85%) stated that the neck support pillow had a positive effect on sleep ($p < .05$). Another 13 said that they slept better than with their own pillow. Of the 36 persons who had a positive effect on sleep from the pillow, 22 (61%) ranked pillow 3 as the best.

Of the 55 subjects, 17 had previously come into contact with some kind of neck support pillow, 10 by the recommendation of a physiotherapist, two by the recommendation of acquaintances, three by press advertisement and two through a bedding shop. When asked to state the characteristics of the ideal pillow, 47 of 52 replied that the pillow should be soft, and 44 of 51 replied that it should provide firm support for the neck. Pillow height could only be specified as "just right, not too high" by the subjects. When questioned about the ideal material of the pillow, three stated that the pillow should be airy and allergy-tested and four said that it should be moldable. Forty-two of the subjects demanded that it should be possible to wash the pillow at 40°C and nine said that it should be machine-washable.

When the six different pillows were compared, pillow 3 had significantly ($p < .0001$) more points [5.3 ± 1.1 (mean ± standard error); median, 6) than pillows 1 and 2, which scored the same average points (Figure 7). Examining the data along gender lines, we discovered that pillow 3 scored the most points among women ($p < .0001$; Table 1), whereas men ranked pillow 3 best, pillow 6 second-best and pillow 1 third-best (Table 1). No statistically significant difference was seen among these three pillows (pillow 3 to pillow 6, $p = .22$; pillow 3 to pillow 1, $p = .06$).

When asked why they thought a particular pillow was best, the persons who chose pillow 3 stated that it was the softest, it provided neck support and it relaxed them. Those who chose pillow 6 valued its moldability. When the subjects were asked why they thought certain pillows were the worst, 22 stated that the pillow was of the wrong shape, 21 that the pillow was too hard and uncomfortable, four did not like the material and two thought that the pillow was too high.

DISCUSSION

Many special neck support pillows are on the market; to our knowledge, however, there were no published studies showing the effects of such pillows. We did discover a surprising

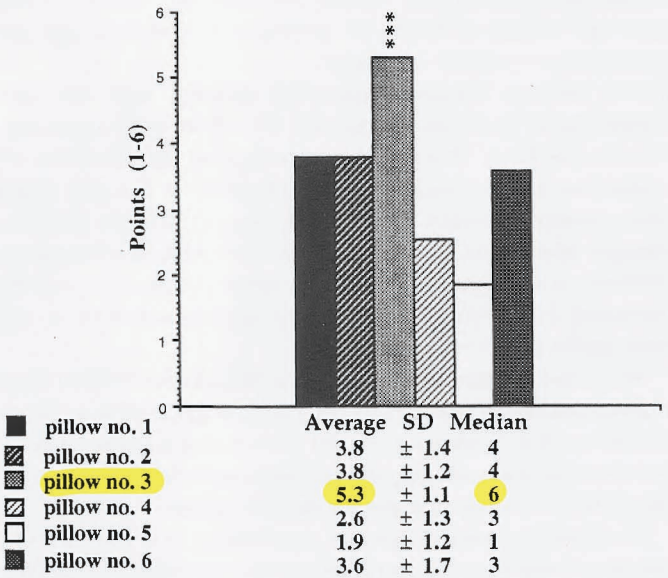

Fig. 7 *The average score, standard deviation and median value after grading the pillows (1–6).* ***, $p < .001$.

Table I. *Grading of various pillows by women and men (n = 55).*

	Women (n = 38)						Men (n = 17)					
	Pillow number						Pillow number					
	1	2	3	4	5	6	1	2	3	4	5	6
Best	3	4	24	0	1	6	4	0	9	0	0	4
Next best	9	13	8	0	1	7	3	1	4	3	1	5
Third best	11	11	4	7	2	3	4	5	1	4	1	2
Fourth best	9	6	2	11	4	6	3	5	1	3	1	4
Fifth best	4	4	0	10	10	10	1	6	2	2	5	1
Worst	2	0	0	10	20	6	2	0	0	5	9	1

number of hospital employees who had periodic neck problems. The majority of test persons, especially those having periodic neck pain, had positive responses to the neck pillows and experienced better rest and quality of sleep and less neck tension and pain. This shows that special neck pillows can help some people get better rest.

Recently, Lavin et al. tested three types of pillows on 47 patients with neck pain in a 5-wk study (8). They found the water-based pillow to be better than the roll-type, and both were better than an ordinary pillow. The theoretical framework for this could be that when a person suffers muscular neck pain, the natural cervical lordosis straightens out; thus, people feel more comfortable with firm neck support. Another possibility could be that a neck pillow does not change form and consistency; therefore, when lying in lateral position, a firm pillow supports the head, keeping it well aligned.

This study is not fully comprehensive but has attempted to include pillows of different characteristics, shapes and materials. On the Scandinavian market, there are some 20 "special" pillows that claim to help and relieve neck problems. Fewer than half are available from registered physiotherapists. The others are sold by mail order, department stores, health food shops, on television, etc. Very similar products have not been included because it would be too difficult to distinguish and grade a large number of pillows.

The subjects consisted largely of hospital staff, who are often exposed to physical strain and who often work in uncomfortable positions. The questionnaire showed that 24 of the 37 employees had had neck pain, and it is possible that they had a more positive attitude toward neck support pillows than the average population. Neck problems with pain, tenderness or stiffness are common (1, 2), and most people seem to be interested in prevention. None of the persons asked to try the neck pillows refused to participate.

We chose a rather short test period and considered that three nights should be a sufficiently long time to get used to a pillow for evaluation. With a longer test period, it would be difficult to remember the various pillows. There was also time to retest the pillows if so desired during the test period.

To identify a good shape and consistency, it is important to ask about both negative and positive characteristics. The pillow that was graded as the best differed from the others in being cut of soft polyurethane, enclosing two firmer supporting cores with one low and one high side. People did not want the pillow to be too high. The pillow that had the best score did not have the lowest height, but the subjects perceived it that way. The polyurethane was the softest material, which meant it had a high level of elasticity and yielded when supporting the head. Washing advice was the same for all pillows, except for pillow 6, which does not indicate if the core can be washed. The 1997 price of these pillows is between $45 and $95 (U.S.). Cheaper pillows may be purchased on the market by mail order or in department stores. These are usually copies. The price was not a decisive factor regarding the quality of the neck support pillow, and we found no correlation between the price and the ranking of the pillow.

CONCLUSION

A neck pillow with a good shape and graded consistency may reduce neck pain and improve night rest. We found that a soft, not-too-high pillow with enough support for the cervical lordosis, created by separate cores, was the optimal type.

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