NECK AND SHOULDER DISORDERS IN MEDICAL SECRETARIES

Part I. Pain Prevalence and Risk Factors

Kitty Kanwendo, Steven James Linton and Ulrich Mottitz

From the Occupational Health Care Center, Örebro Medical Center, S-70185 Örebro, Department of Occupational Medicine, Örebro Medical Center, S-70185 Örebro, and Department of Physical Therapy, Lund University, S-22100 Lund, Sweden

ABSTRACT. 420 medical secretaries took part in a cross-sectional study aimed at examining the prevalence of musculoskeletal disorders as well as the relationship between neck and shoulder pain and possible risk factors. Sixty-three percent had experienced neck pain sometime during the previous year and while 15% had suffered almost constant pain 22% had experienced neck pain only occasionally. Shoulder pain during the previous year had been experienced by 62%, 17% had suffered almost constant pain while 29% had experienced pain only occasionally. Fifty-one percent had experienced low back pain. Age and length of employment were significantly related to neck and shoulder pain. Furthermore, working with office machines 5 hours or more per day was associated with a significantly increased risk for neck pain (OR 1.7), shoulder pain (OR 1.9) and headache (OR 1.8). Finally, a poorly experienced psychosocial work environment was significantly related to headache, neck, shoulder and low back pain. The results of this study suggest that work with office machines as well as the psychosocial work environment are important factors in neck and shoulder pain.

Key words: musculoskeletal pain, work environment, risk factors.

Musculoskeletal disorders of the neck and shoulders are receiving an increasing amount of attention (4). Earlier reports from Japan suggested that the problem was growing (12), and Swedish statistics on occupational injuries show an increase in the number of reported neck and shoulder disorders during the years 1982–1985 (13). Factory workers as well as office workers have been mentioned as risk groups (8, 12), and female workers in Sweden report relatively more injuries in the neck, shoulders, and arms than do men (11).

A variety of risk factors has been suggested for neck and shoulder disorders. One example is the introduction of modern technology resulting in specialized monotonous tasks which imposes static or repetitive loads. Consequently, a relationship has been shown between time spent working with office machines, including visual display units (VDU), and the occurrence of musculoskeletal symptoms (9, 14). Other studies have indicated that the problem is multifactorial with mental strain, lack of control, and low job satisfaction being important factors in the development of the disorder (12, 15, 16).

There is little agreement concerning the prevalence of neck and shoulder disorders in office workers ranging from 11% (7) to as much as 81% (15). Thus, there remains uncertainty concerning the magnitude of the problem. The cited studies indicate that office personnel may constitute a group at risk for developing musculoskeletal pain although the magnitude of the disorder and the complexity of the problem still is not fully understood. The aim of this study was to investigate the prevalence of experienced musculoskeletal disorders among medical secretaries and to analyse the relationship between neck and shoulder disorders and various risk factors including those related to the psychosocial work environment.

MATERIAL AND METHOD

Subjects

438 female secretaries employed on a monthly basis and currently working at the Medical Center Hospital in Örebro (153 both) during the autumn of 1985 were asked to participate in the study.

The participation rate was 96% (420). The responders’ mean age was 39 years (SD 11.7 years). Sixty-eight percent of the secretaries had worked 10 years or less with secretarial work (mean 8.3, SD 6.8 years). Fifty-six percent worked full-time, that is 40 hours per week, 23% worked 30 hours per week, and 21%, finally, worked 20 hours per week.

The secretaries’ major tasks were typing patient journals, letters, and reports. In addition telephone, mail, and appointment...
ment duties formed part of their daily work routines. The emphasis on the various tasks, however, varied from depart-
ment to department as well as from day to day. Seventy-five percent of the respondents said they spent 5 hours or more per day at work, and 43% reported working with office machines, e.g. typewriter or visual display unit for 3 hours or more daily. By contrast, 25% reported working only 1-2 hours daily with office machines.

Method

A questionnaire containing 48 items was used. Two questions dealt with neck and shoulder pain experienced during the previous year and used a 6-point frequency scale ranging from “very often” to “almost never”. One question asked whether or not the secretaries had experienced headache. The Nordic Musculoskeletal Pain Questionnaire was also included (10). This standard format, employing a nominal yes or no scale, referred to nine body areas including the neck and shoulders. For each body area the subjects were asked whether or not they had felt discomfort, ache, or pain during the previous year, whether they had experienced pain during the last 7 days, and whether the pain had prevented them from doing their daily duties.

In addition, the secretaries were asked to rate their experi-
enced psychosocial work environment on a 10 question standardized form employing a 4 category scale from “very usu-
ally” to “no never” (6). The questions are listed in Table 1.

The questionnaire also included items concerning length of secretarial employment, the extent of employment (part or full-time), and daily average number of hours spent sitting respectively working with office machines.

As an explanatory letter accompanied the forms which were mailed to the participants. Subsequently, two reminder let-
ters were sent out. The secretaries were assured that the collected data would be handled confidentially.

The study was conducted by the hospital’s Occupational Health Care Center in cooperation with the Department of Occupational Medicine. The hospital’s Health and Safety Committee as well as the Board of Ethics approved the study and office managers and union representatives were in-
formed about the project.

Statistical analyses

Data were summarized to provide prevalence rates and fre-
quency distributions. Since the data were on both nominal and ordinal levels, relationships between dependent and in-
dependent variables were examined by use of the chi-square test for independence. For neck and shoulder pain the 6-point scale served as a dependent variable. In order to avoid ex-
pected frequencies of less than 5 in the chi-square contingency table, adjacent categories were combined, thus providing a three category scale (0-1 points, 2-3 points, 4-6 points, 7-8 points, 9-10 points). For headache as well as low back pain the yes/no scale was used as the dependent vari-
able.

For analyses of stratified data those frequently having neck and shoulder pain (1-3 points) were compared with those less frequently having pain (4-6 points), and Mumenthaler-Harms test for ordinal variables (OMH) with 95% confidence intervals were calculated.

Since the 10 psychosocial work environment questions all used a 1-4 category scale, an index ranging from 0-40 points was calculated. A “good” environment was defined as a score between 10-20 points, and a “poor” environment as a score less than 21. The groups were then compared in terms of outcome on the dependent variable in the manner outlined above.

As a basis for comparison with earlier research (14) “long exposure” (1-4 hours) and “high exposure” (5-8 hours) for sitting or working with office machines were used as the independent variables in 2 x 2 contingency tables. As the dependent variable for neck and shoulder pain, the domi-
nated 6 point scale (1-3 points and 4-6 points) was used.

RESULTS

Pain prevalence

Musculoskeletal pain experienced during last year (period prevalence) as well as pain experienced during last 7 days (point prevalence) are displayed in Fig. 1. Neck and shoulder pain show the highest period prevalence rates (63 and 62% respectively) followed by low back pain (51%). Similarly, the highest point prevalence rates were found for neck and shoulder pain (33 and 34% respectively) followed by low back pain (25%). In addition 31% of the participants had experienced pain from headache during the previous year.

There was considerable overlap between the three major pain areas. Fifty-two percent of all respondents had experienced both neck and shoulder pain, 33% had shoulder pain and low back pain, and 36% neck and low back pain. Finally, 31% had experienced pain from all three major pain sites.

Although approximately two thirds of the secretaries had experienced pain, the more detailed informa-

Table 1. Psychosocial questions

<table>
<thead>
<tr>
<th>Question</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you regard your work as interesting and stimulating?</td>
<td></td>
</tr>
<tr>
<td>2. Is there enough variation in your work?</td>
<td></td>
</tr>
<tr>
<td>3. Are you told if you do a good job?</td>
<td></td>
</tr>
</tbody>
</table>
| 4. Is there good contact and cooperation between yourself and your super-
  visor?                                                                |                  |
| 5. Is there a friendly spirit of cooperation between you and your fellow
  workers?                                                             |                  |
| 6. Do you get help and support if you run into difficulties in your
  work?                                                                |                  |
| 7. Are you able to influence your working conditions?                   |                  |
| 8. Are you given too much to do?                                        |                  |
| 9. Are the demands of your work too great for you?                      |                  |
| 10. Do you feel anxious about the possibility of your work situation
    being changed by reorganization, introduction of new techniques etc?  |                  |

Fig. 1. Prevalence rates of musculoskeletal pain experienced some time during the previous year respectively during the last 7 days (n=420).

Fig. 2. Distribution of experienced pain in the neck and shoulders during the previous year (n=420).

*9-1123*
ment duties formed part of their daily work routines. The emphasis on the various tasks, however, varied from depart-
ment to department as well as from day to day. Seventy-five percent of the respondents said they spent 5 hours or more per day at work, and 43% reported working with office machines, e.g. typewriter or visual display unit 3 hours or more daily. By contrast, 25% reported working only 1–2 hours daily with office machines.

Method

A questionnaire containing 48 items was used. Two questions dealt with neck and shoulder pain experienced during the previous year and used a 6-point frequency scale ranging from “very often” to “almost never”. One question asked whether or not the accidents had often experienced backache. The Nordic Musculoskeletal Pain Questionnaire was also includ-
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er they had felt discomfort, ache, or pain during the previous year, whether they had experienced pain during the last 7 days, and whether the pain had prevented them from doing their daily duties.

In addition, the secretaries were asked to rate their experi-
enced psychosocial work environment on a 10 question standardised form employing a 4 category scale from “very

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tariat employment, the extent of employment (part- or full-time), and daily average number of hours spent sitting re-
spired working with office machines. An explanatory letter accompanied the forms which were mailed to the participants. Subsequently, two reminder let-
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dependent variables were examined by use of the chi-square test for independence. For neck and shoulder pain the 6 point scale served as a dependent variable. In order to avoid ex-
pected frequencies of less than 5 in the chi-square contingency table, adjacent categories were combined, thus providing a three category scale (often = 1–2 points, sometimes = 3–4 points, seldom = 5–6 points). For backache as well as low back pain the yes/no scale was used as the dependent vari-
able.

For analyses of stratified data those frequently having neck and shoulder pain (1–3 points) were compared with those less frequently having pain (4–6 items), and Munthe-Haartoft odds ratio (OR/MH) with 95% confidence intervals were calculated.

Since the 10 psychosocial work environment questions all

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<tr>
<td>1. Do you regard your work as interesting and stimulating?</td>
</tr>
<tr>
<td>2. Is there enough variation in your work?</td>
</tr>
<tr>
<td>3. Are you told if you do a good job?</td>
</tr>
<tr>
<td>4. Is there good contact and cooperation between you and your supervisors?</td>
</tr>
<tr>
<td>5. Is there a friendly spirit of cooperation between you and your fellow workers?</td>
</tr>
<tr>
<td>6. Do you get help and support if you run into difficulties in your work?</td>
</tr>
<tr>
<td>7. Are you able to influence your working conditions?</td>
</tr>
<tr>
<td>8. Are you given too much to do?</td>
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<td>9. Are the demands of your work too great for you?</td>
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<td>10. Do you feel anxiety about the possibility of your working situation being changed by reorganization, introduction of new techniques etc?</td>
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used a 1–4 category scale, an index ranging from 10–40 points was calculated. A “good” environment was defined as a score between 10–20 points, and a “poor” environment as a score between 31–40 points. The two groups were then compared in terms of outcome on the dependent variable in the manner outlined above.

As a basis for comparison with earlier research (14) “low” exposure (1–4 hours) and “high” exposure (5+ hours) for sitting or working with office machines were used as the independent variables in 2x2 contingency tables. As the dependent variable for neck and shoulder pain, the dichotomized 6 point scale (1–3 points and 4–6 points) was used.

RESULTS

Pain prevalence

Musculoskeletal pain experienced during last year (period prevalence) as well as pain experienced during last 7 days (point prevalence) are displayed in Fig. 1. Neck and shoulder pain show the highest period prevalence rates (63 and 62% respectively) followed by low back pain (51%). Similarly, the highest point prevalence rates were found for neck and shoulder pain (33 and 34% respectively) followed by low back pain (25%). In addition 31% of the participants had often suffered from headache during the previous year.

There was considerable overlap between the three major pain areas. Fifty-two percent of all respondents had experienced both neck and shoulder pain, 32% had neck and low back pain, and 36% neck and low back pain. Finally, 31% had experienced pain from all three major pain sites.

Although approximately two thirds of the secretaries had experienced pain, the more detailed informa-

Fig. 1. Prevalence rates of musculoskeletal pain experienced some time during the previous year respectively during the last 7 days (n=429).

Fig. 2. Distribution of experienced pain in the neck and shoulders during the previous year (n=429).

n=9/0123
their daily duties while another 13% reported shoulder pain to be the cause. Of those reporting pain in the lower back, 19% reported that they had been prevented from fulfilling their daily duties.

**Age, length, and extent of employment**

Neck and shoulder pain increased significantly with age (Table II). Likewise there was a significant association with length of secretarial employment (Table III). Since age and length of employment were likely to be interrelated, i.e. age acting as a confounding factor, the secretaries were stratified according to age, and those having worked 5 years or less were compared with those having worked more than 5 years. The dichotomized 6 point scale, as previously described, was used. When age was thus controlled for, working more than 5 years significantly increased the risk for shoulder pain (OR(MH) = 1.94, 95% CI = 1.13-3.36) but not for neck pain (OR(MH) = 1.61, 95% CI = 0.93-2.79).

Headache did not show any significant relationship with either age, length, or extent of employment.

Furthermore, there was no significant relationship between neck or shoulder pain and the extent of employment. Thirty-five percent of the part-time workers experienced neck pain and 38% experienced shoulder pain often or sometimes during the previous year. For full-time workers the rates were 39% (neck) and 41% (shoulders).

**Hours spent sitting respectively working with office machines**

The frequency (often, sometimes, seldom) of experienced neck and shoulder pain was not significantly associated with sitting five hours or more per day. Nor was there any significant association between experienced headache or low back pain and sitting five hours or more. When odds ratios were calculated they were elevated but not significant for neck pain (OR = 1.9, 95% CI = 0.86-2.61) and for shoulder pain (OR = 1.55, 95% CI = 0.90-2.67). Odds ratios for headache (OR = 0.93, 95% CI = 0.57-1.51) and low back pain (OR = 0.97, 95% CI = 0.58-1.64) were neither elevated nor significant.

On the other hand, work with office machines five hours or more per day was significantly associated with the frequency of experienced shoulder pain (OR = 3.62, p = 0.043) and headache (OR = 6.55, p = 0.011), but not with low back pain. For neck pain there was a tendency for secretaries, who worked five hours or more, to experience neck pain more frequently, but the association was not significant (OR = 3.84, p = 0.147). When odds ratios were calculated they were elevated and significant for neck pain (OR = 1.65, 95% CI = 1.02-2.67), shoulder pain (OR = 1.87, 95% CI = 1.18-2.98) and headache (OR = 1.77, 95% CI = 1.4-2.25) but not for low back pain (OR = 0.93, 95% CI = 0.62-1.39).

**Psychosocial work environment**

The psychosocial work environment was dominated by three positive findings: 1) 73% of the secretaries reported that they usually experienced good contact with supervisors, 2) 73% experienced good cooperation with fellow workers, and 3) 64% felt that they usually received help and support when they encountered problems with their work. On the other hand 44% experienced that they seldom or never were told if they did a good job and 39% felt that they seldom or never could influence their work.

When the 10 psychosocial questions were summed up in an index, 69% of the secretaries experienced a "good" environment whereas the remaining 31% experienced a "poor" psychosocial environment.

Headache and a higher frequency of neck and shoulder pain as well as the prevalence of low back pain was found to be significantly related to a poorly experienced psychosocial work environment (Table IV).

When the 10 psychosocial questions were examined separately the three categories were compared. The ability to influence one's working conditions was significantly associated with neck, shoulder, low back pain, and headache.

**DISCUSSION**

While the results of this study showed a high, approximately 60% period prevalence for experienced neck and shoulder pain in medical secretaries, and some 15% were found to suffer from frequent pain, approximately 30% experienced only occasional pain. Age, length of employment, hours working with office machines, and a poor psychosocial work environment were risk factors significantly associated with pain. The prevalence rates correspond to those reported by Gerner-Hesselink & Jonsson (3), showing the highest rates for neck and shoulder pain, followed closely by that of low back pain. This is an important replication since both studies used the Nordic Muscular Pain Questionnaire with medical secretaries. The present study also showed that although the prevalence was as high as 60%, the majority of the sufferers did not experience pain frequently. Of those actually

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Table II. Relationship of neck and shoulder pain with age

<table>
<thead>
<tr>
<th>Pain site</th>
<th>Occur</th>
<th>Sometimes</th>
<th>Seldom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>11</td>
<td>16</td>
<td>96</td>
</tr>
<tr>
<td>Shoulders</td>
<td>14</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>16</td>
<td>19</td>
</tr>
</tbody>
</table>

**Table III. Relationship of neck and shoulder pain with length of secretarial employment**

<table>
<thead>
<tr>
<th>Pain site</th>
<th>0-60</th>
<th>61-120</th>
<th>121-180</th>
<th>&gt; 180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>12</td>
<td>16</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>Sometimes</td>
<td>27</td>
<td>18</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Seldom</td>
<td>12</td>
<td>16</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

**Table IV. Relationship of headache, neck, shoulder, and low back pain with a "good" versus a "poor" psychosocial work environment**

<table>
<thead>
<tr>
<th>Pain site</th>
<th>&quot;Good&quot;</th>
<th>&quot;Poor&quot;</th>
<th>( \chi^2 )</th>
<th>d.f.</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>40</td>
<td>31</td>
<td>6.32</td>
<td>1</td>
<td>0.043</td>
</tr>
<tr>
<td>Shoulders</td>
<td>40</td>
<td>36</td>
<td>3.84</td>
<td>1</td>
<td>0.147</td>
</tr>
<tr>
<td>Low back</td>
<td>125</td>
<td>86</td>
<td>1.77</td>
<td>1</td>
<td>0.195</td>
</tr>
<tr>
<td>Headache</td>
<td>76</td>
<td>48</td>
<td>9.15</td>
<td>1</td>
<td>0.003</td>
</tr>
</tbody>
</table>

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their daily duties while another 13% reported shoulder pain to be the cause. Of those reporting pain in the lower back, 19% reported that they had been prevented from fulfilling their daily duties.

**Age, length, and extent of employment**

Neck and shoulder pain increased significantly with age (Table II). Likewise there was a significant association with length of secretarial employment (Table III). Since age and length of employment were likely to be interrelated, i.e. age acting as a confounding factor, the secretaries were stratified according to age, and those having worked 5 years or less were compared with those having worked more than 5 years. The dichotomized 6 point scale, as previously described, was used. When age was thus controlled for, working more than 5 years significantly increased the risk for shoulder pain (OR=1.94, 95% CI=1.13-3.36) but not for neck pain (OR=1.61, 95% CI=0.93-2.79). Headache, did not show any significant relationship with either age, length, or extent of employment.

Furthermore, there was no significant relationship between neck or shoulder pain and the extent of employment. Thirty-five percent of the part-time workers experienced neck pain and 38% experienced shoulder pain, often or sometimes during the previous year. For full-time workers the rates were 39% (neck) and 41% (shoulders).

**Hours spent sitting respectively working with office machines**

Neck pain and shoulder pain was not significantly associated with sitting five hours or more per day. Nor was there any significant association between experienced headache or low back pain and sitting five hours or more. When odds ratios were calculated they were elevated but not significant for neck pain (OR=1.49, 95% CI=0.86-2.61) and for shoulder pain (OR=1.55, 95% CI=0.90-2.76). Odds ratio for headache (OR=0.95, 95% CI=0.57-1.51) and low back pain (OR=0.92, 95% CI=0.58-1.48), were neither elevated nor significant.

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Table V. Relationship of psychosocial questions and pain

<table>
<thead>
<tr>
<th>Psychological questions</th>
<th>Pain site</th>
<th>Shoulder</th>
<th>Low back</th>
<th>Headache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you regard your work as interesting and stimulating?</td>
<td>NS</td>
<td>NS</td>
<td>$\chi^2(2)=6.24$</td>
<td>NS</td>
</tr>
<tr>
<td>Is there enough variation in your work?</td>
<td>NS</td>
<td>NS</td>
<td>$\chi^2(2)=3.6$</td>
<td>NS</td>
</tr>
<tr>
<td>Is there a friendly spirit of cooperation between you and your fellow workers?</td>
<td>$\chi^2(4)=12.57$</td>
<td>$p=0.011^*$</td>
<td>$\chi^2(4)=8.28$</td>
<td>NS</td>
</tr>
<tr>
<td>Do you get help and support if you run into difficulties in your work?</td>
<td>NS</td>
<td>NS</td>
<td>$\chi^2(2)=14.65$</td>
<td>NS</td>
</tr>
<tr>
<td>Are you able to influence your working conditions?</td>
<td>$\chi^2(4)=18.08$</td>
<td>$p=0.001$</td>
<td>$\chi^2(4)=16.07$</td>
<td>$p=0.003$</td>
</tr>
<tr>
<td>Are you given too much to do?</td>
<td>$\chi^2(4)=13.37$</td>
<td>$p=0.010$</td>
<td>$\chi^2(2)=9.03$</td>
<td>$p=0.003$</td>
</tr>
</tbody>
</table>

* Expected frequencies $<5$; 2 of 9 cells.

experiencing pain, only 13% were prevented from performing their daily duties due to neck or shoulder pain. Thus, for the majority, the pain was not of a disabling nature. However, early neck and shoulder pain may be a predictor of future pain development and could possibly be a warning signal. It has been shown that previous low back pain may indeed predict future low back pain (2, 3). Further studies of a long-term prospective nature would be necessary to shed light on this question.

The amount of time spent sitting down did not appear to be related to pain. Although the odds ratios for neck and shoulder pain were elevated, they were not significant. On the other hand five or more hours work with office machines significantly increased the risk primarily for shoulder pain and headache. While this may at first appear contradictory, it indicates that the mere act of sitting was not necessarily the crucial variable, but that the content of the work while sitting was important. For example, although a particular job may be classified as a “sitting job” it may nevertheless include a variety of tasks making the work “dynamic” for the neck and shoulders rather than “static”. On the other hand, when office machines are used during the greater part of the day the worker may be forced to adopt more static postures (7). It must also be pointed out that there could be individual differences in the actual posture adopted for a given task. In order then, to better understand the different aspects of physical work load risk factors, a more detailed study of the frequency of postural changes as well as an observation of individually adopted postures would be necessary.

Although the psychosocial work environment on the whole was judged to be fairly good, a correlation was found between poor psychosocial work environment and experienced pain. This is consistent with other studies. Berglund et al. (1), for instance, found that subjects with a history of shoulder pain were less satisfied with their jobs, and Linton (11) reported that a “poor” psychosocial work environment was associated with an increased risk for both neck and back pain. Two psychosocial questions of importance appeared to be the ability to influence one’s work and “having too much to do”.

The cross-sectional nature of this study does not allow us to draw any cause-effect conclusions. However, the results do suggest the need for further studies concerning the role of office machines and the psychosocial work environment in the development of neck and shoulder pain in medical secretaries.

ACKNOWLEDGEMENTS

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Address for offprints: Kitty Kammdott Landshögsbean Fredsgatan 27 A S-70163 Örebro Sweden
experiencing pain, only 13% were prevented from performing their daily duties due to neck or shoulder pain. Thus, for the majority, the pain was not of a disabling nature. However, early neck and shoulder pain may be a predictor of future pain development and could possibly be a warning signal. It has been shown that previous low back pain may indeed predict future low back pain (2, 3). Further studies of a long-term prospective nature would be necessary to shed light on this question.

The amount of time spent sitting down did not appear to be related to pain. Although the odds ratios for neck and shoulder pain were elevated, they were not significant. On the other hand five or more hours work with office machines significantly increased the risk primarily for shoulder pain and headache. While this may at first appear contradictory, it indicates that the mere act of sitting was not necessarily the crucial variable, but that the content of the work while sitting was important. For example, although a particular job may be classified as a “sitting job” it may nevertheless include a variety of tasks making the work “dynamic” for the neck and shoulders rather than “static”. On the other hand, when office machines are used during the greater part of the day the worker may be forced to adopt more static postures (7). It must also be pointed out that there could be individual differences in the actual posture adopted for a given task. In order then, to better understand the different aspects of physical work load risk factors, a more detailed study of the frequency of postural changes as well as an observation of individually adopted postures would be necessary.

Although the psychosocial work environment on the whole was judged to be fairly good, a correlation was found between a poor psychosocial work environment and experienced pain. This is consistent with other studies. Bergenlind et al. (1), for instance, found that subjects with neither a history of shoulder pain were less satisfied with their jobs, and Linton (11) reported that a “poor” psychosocial work environment was associated with an increased risk for both neck and back pain. Two psychosocial questions of importance appeared to be the ability to influence their work and “having too much to do”.

The cross-sectional nature of this study does not allow us to draw any cause-effect conclusions. However, the results do suggest the need for further studies concerning the role of office machines and the psychosocial work environment in the development of neck and shoulder pain in medical secretaries.

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Address for offprint:

Kitty Kammendo
Landskapsläkaråk
Fredsgatan 27 A
S-70163 Örebro Sweden

Scand J Rehab Med 23

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