Hand and wrist problems in general practice—patient characteristics and factors related to symptom severity

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Objectives. Hand and wrist problems are common, but little is known about characteristics of patients consulting the general practitioner (GP) for these problems. The objectives are: (i) to describe wrist and hand problems presented to the GP in terms of severity of symptoms, and their impact on physical, emotional and social functioning; (ii) to describe patient and disease characteristics across different diagnostic categories; and (iii) to study factors related to the severity of hand or wrist problems.

Methods. Patients consulting their GP with hand or wrist problems were sent a questionnaire containing questions on socio-demographic variables, characteristics of the complaint, physical activity and psychosocial factors. The GP recorded information on symptoms, signs and medical diagnosis. We studied the cross-sectional association between a variety of factors and severity of hand or wrist problems, using the Symptom Severity Scale as the outcome measure.

Results. Mean age of the 267 participants was 49.3 yrs and 74% were female. The three most frequently recorded diagnoses were osteoarthritits (17%), tenosynovitis (16%) and nerve entrapment (12%). The characteristics of patients varied slightly across diagnostic categories. Patients who did not have paid work, had longer duration of symptoms, diagnosis of entrapment, higher pain intensity, higher body mass index and higher scores on worrying reported significantly higher scores on severity of hand or wrist problems (P-value <0.10).

Conclusion. Primary care patients with hand or wrist problems report pain and reduced function. Impact on other aspects of perceived health is limited. Severity seems to be associated with socio-demographic, physical and psychosocial factors, more than with medical diagnosis.

KEY WORDS: Primary care, Hand or wrist problems, Diagnosis, Cross-sectional study, Pain.

Introduction

Hand and wrist problems are common. In recent studies, the prevalence in the Dutch population has been estimated at 12.5% [1]. Not all people suffering from hand and wrist problems consult their general practitioner (GP). The incidence in general practice is estimated at 4.6/1000/yr for wrist complaints and 7.8/1000/yr for hand and finger complaints [2]. A good hand and wrist function is indispensable for performing activities of daily living. Therefore, the impact of, for example, hand osteoarthritis, hand rheumatoid arthritis or carpal tunnel syndrome is considerable [3–6]. In The Netherlands, as in several other European countries, the GP provides care for the majority of patients with musculoskeletal disorders. Nevertheless, studies in primary care, in which the patient population is more heterogeneous compared with rheumatology practice, are rare. Little is known about the characteristics of patients presenting with hand and wrist problems in primary care. Because of this lack of information, GPs may encounter difficulties in managing hand and wrist problems. The objectives of this article are: (i) to describe wrist and hand problems presented to the GP in terms of severity of symptoms, and their impact on physical, emotional and social functioning; (ii) to describe patient and disease characteristics across different diagnostic categories; and (iii) to investigate which factors were most strongly related to the severity of hand or wrist problems.

Methods

Study design and population

We conducted an observational study in 32 general practices (44 GPs) in The Netherlands. The GPs received a 3h training session before the start of the study focused on diagnosing hand and wrist problems (relevant history, physical examination, differential diagnosis). Between July 2004 and December 2005, GPs were asked to recruit 10 consecutive patients with a new episode of hand or wrist problems. An episode was considered to be ‘new’ if participants had not visited their GP for the same problem during the preceding 3 months. Patients were eligible for participation in the study if they were 18 yrs or older and capable of completing Dutch questionnaires. Patients were excluded if the presented symptoms were caused by an acute injury (fracture, dislocation, sprain) or by vascular or skin problems. Eligible patients were informed about the study by their GP. If interested, the investigator sent additional information about the study, a consent form and a self-administered postal questionnaire to the patient. A reminder was sent after 12 days. Patients who still did not return the questionnaire were contacted by telephone within 3 weeks. Patients who returned an incomplete questionnaire were contacted to complete the questionnaire by telephone interview. Furthermore, we asked the GPs to complete a diagnosis and management registration form after the first consultation. On this registration form, they recorded information about history, physical examination, medical diagnoses and management of the hand or wrist problem (wait and see, advice, splint, additional diagnostic tests, medication and referrals). The study was approved by the Medical Ethics Committee of the VU University Medical Center in Amsterdam.

Data collection

The questionnaire contained several questions on socio-demographic variables, characteristics of hand and wrist complaints, physical activity, physical load, body mass index (BMI) and psychosocial factors.
Outcome measures. First, severity of hand and wrist problems was measured by the Symptom Severity Scale (SSS) [7]. The SSS is a self-administered questionnaire originally developed to assess the severity of symptoms in patients with carpal tunnel syndrome. It incorporates six clinical areas, namely pain, paraesthesia, numbness, weakness, nocturnal symptoms and over-all function. The questionnaire contains 11 questions with response options ranging from 1 point (mildest) to 5 points (most severe). The total symptom severity score is calculated as the mean of the scores for the 11 individual items. In a recent study, the SSS was shown to be reliable and responsive in our heterogeneous primary care population with hand or wrist problems [8]. The second outcome measure, perceived health, was measured using the short form health survey (SF-36) [9]. The SF-36 is designed to assess eight health concepts relevant to a person’s functional status and well being: physical functioning (PF), role limitations in physical functioning (RP), role limitations in emotional functioning (RE), social functioning (SF), bodily pain (BP), mental health (MH), vitality (VT) and general health (GH). Scale scores range from 0 to 100 with higher scores representing better perceived health.

Patient and disease characteristics. The following factors were measured at baseline:

- Socio-demographic factors: age, gender, marital status, educational level and work status.
- BMI (calculated from self-reported weight and height). Underweight/normal weight was defined as BMI of 25 or lower, overweight as BMI between 25 and 30 and obesity as BMI of 30 or higher.
- Physical load during work and leisure time, using the 20-item Dutch musculoskeletal questionnaire (DMQ) with a score ranging between 0 (no physical workload) and 100 (highest physical workload) [10].
- Characteristics of hand or wrist problems: duration of symptoms, previous episodes, dominant/non-dominant side affected, GP diagnosis and pain intensity (0–10 point rating scale).
- Physical activity: we used two questions to measure frequency and intensity of physical activity. Patients were coded as meeting the Dutch Norm for Healthy Activity (yes or no) if they reported 30 min or more of moderate-intensity physical activity on at least 5 days of the week [11, 12]. Additionally, they were coded as meeting the American College of Sports Medicine (ACSM) position stand (yes or no) if they performed heavy exercise or sports at least 3 times a week [13].
- Psychosocial factors: coping was measured with the Pain Coping Inventory (PCI), consisting of 6 scales: pain transformation, distraction, reducing demands, retracting, worrying and resting [14, 15]. A higher score indicates more use of the strategy concerned. Personal control was measured by the subscale personal control of the Revised Illness Perception Questionnaire (IPQ-R, 1–5) [16, 17]. A higher score indicates stronger personal control. Distress and somatization were measured using the 16-item subscales of the 4 Dimensional Symptom Questionnaire (4DSQ, 0–32) [18]. A cut-off score of >10 for both distress and somatization discriminates between ‘cases’ and ‘non-cases’ [19, 20]. Fear avoidance beliefs were measured by the 4-item physical activity subscale of the Fear Avoidance Beliefs Questionnaire (FABQ, 0–24), with a higher score indicating more fear avoidance [21]. Social support was measured with the Social Support Scale (12–60) on which a higher score indicates less social support [22]. Anxiety and depression symptoms were measured with the Hospital Anxiety and Depression Scale (HADS, 0–21), with higher scores indicating more severe symptoms [23]. For both subscales, scores of 0–7 points indicated no anxiety or depression, scores of 8 or higher indicates possible or probable anxiety or depression [24].

Statistical analysis

Univariable linear regression analyses were performed to check whether there was a linear association between each of the patient or disease characteristics and symptom severity (score on the SSS). For dichotomous variables we only considered those variables with a prevalence of at least 10%. Factors that were non-linearly related to the outcome were in principle divided into tertiles (low, medium, high), with the ‘low-category’ as reference category. However, when this was not possible, or when cut-off scores were available from the literature, factors were dichotomized. We present the univariate regression coefficients (b) along with the 95% confidence intervals (95% CI). Factors that are associated with the outcome (P-value <0.20) were pre-selected for the multivariable analysis. Before multivariable analysis was applied, the correlation among the factors was checked. In case of a strong correlation (Spearman r > 0.5) between two variables the factor with the strongest univariable association with the outcome was retained in the multivariable regression model. Because the number of factors to be entered in the model exceeded n/10, the factors were entered in blocks (socio-demographic factors, BMI, and physical load first, characteristics of the complaint next, physical activity third and psychosocial factors last) [25]. We developed a multivariable model that included the combination of factors that was most strongly associated with the severity of hand or wrist problems. The best model was constructed using a manual backward selection method. We sequentially deleted factors from the model until only factors with a P-value <0.10 were retained and further elimination resulted in a considerable drop in the explained variance of the model. For the final model the percentage of explained variance (R²) was calculated.

All statistical analysis were performed using SPSS for Windows Version 12.0.1.

Results

Study population and baseline characteristics

GPs asked 301 patients with hand or wrist problems to participate in this study. In total, 267 patients (89%) consented to participate and completed the baseline questionnaire. Baseline characteristics of these 267 patients are shown in Table 1. Mean age was 49.3 (s.d. 16.0) yrs and 74% were female. For 25 patients (9.4%) the GPs recorded more than one diagnosis on the registration form. Of those given only one diagnosis the three most frequently recorded diagnoses were osteoarthritis (16.9%), tenosynovitis (15.8%) and nerve entrapment, including carpal tunnel syndrome (12.4%). Half of the patients had suffered from their symptoms for longer than 3 months when they consulted the GP. In 57 patients (slightly more often with a diagnosis of osteoarthritis compared with other diagnostic categories) the problem was recurrent. The mean severity of symptoms was 2.1 (s.d. 0.6), and the mean intensity of pain was 4.0 (s.d. 2.4). Non-responders (n = 34) were less often female (62%) and slightly younger (mean 44.4 yrs) than responders.

Our responders scored similar or slightly lower (0–5 points) on most of the eight subscales of the SF-36 compared with the Dutch reference population (Fig. 1) [26]. For physical role functioning and bodily pain the mean scores among our responders were approximately 15 points lower.

Table 2 describes patient and disease characteristics stratified by GP diagnosis, presenting differences and similarities across diagnostic categories. Patients with osteoarthritis were on average the oldest, and patients with repetitive strain injury the youngest participants. Patients suffering from rheumatoid arthritis were less often female, scored slightly higher on pain, the pain coping strategy ‘worrying’, anxiety, distress and somatization and were less physically active according to the Dutch Norm for Healthy Activity compared with patients with other diagnoses.
Patients with a ganglion had the lowest score on severity of symptoms. Patients diagnosed with repetitive strain injury (RSI) had increased scores on static posture/repetitive movements, sitting and visual display units (VDU) work, and they were most physically active. Furthermore, patients with more than one diagnosis were more often female, and had slightly increased scores on the pain coping strategies ‘pain transformation’, and ‘distraction’ compared with patients with only one diagnosis. Overall, however, differences between the diagnostic categories were small. For further analyses the total population was used and GP diagnosis included as a factor potentially related to symptom severity.

Factors related to symptom severity

Univariable analyses. The results of the univariable linear regression analyses are presented in Table 3. Almost all baseline and disease characteristics, except marital status, the diagnoses osteoarthritis, RSI and non-specific symptoms and physical activity, were univariably associated with severity of symptoms. Next, the correlation between the associated factors was checked. Retreating as a coping strategy was not entered in the multivariable model because of a strong correlation with the coping strategies, distraction and resting (Spearman $r = 0.60$ and $r = 0.54$, respectively).

Multivariable analyses. The variables retained in the model after manual backward selection are presented in Table 4. Not having paid work, longer duration of symptoms, the diagnosis nerve entrapment, higher pain intensity, higher BMI and higher scores on worrying were significantly associated with increasing severity of hand or wrist problems ($P$-value $<0.10$). The explained variance of the model was 0.55.

Discussion

The present study describes patient characteristics and factors related to severity of hand and wrist problems as presented to the GP. The results showed that the most frequently recorded diagnoses were osteoarthritis, tenosynovitis and nerve entrapment, but we did not find large differences between diagnostic categories in terms of patient and disease characteristics. Patients reported lower perceived health on the subscales RP and BP of the SF-36, but scores on other subscales were comparable with that of a Dutch reference population. The combination of the following six factors was most strongly associated with the severity of hand and wrist problems: not having paid work, higher BMI, longer duration of symptoms, the diagnosis nerve entrapment, higher pain intensity and higher scores on worrying.

Patient and disease characteristics

Musculoskeletal pain comprises an important public health problem due to high impact on disability. In a population-based study Pescovitz and Schouten [1] showed that roughly 30% of responders with pain reported limitations in daily life due to their musculoskeletal pain. They also reported that sick leave for wrist or hand pain was less frequent than for neck, shoulder or back pain. This indicates that the impact of hand and wrist problems on daily living is less than that of many other musculoskeletal problems. The results of our study are consistent with their findings. Our population of patients with hand or wrist problems did not report very high scores for symptoms and pain, and scores on most aspects of perceived health were similar to a reference population. Studies looking at perceived health in more homogeneous populations, for example consisting only of patients with rheumatoid arthritis or osteoarthritis, reported poorer perceived health [27, 28]. We examined subgroups of patients with rheumatoid arthritis or osteoarthritis in our population, but SF-36 scores were not much different from the total population. Patients consulting the GP may have less severe symptoms or present in an earlier phase of the disease than patients in secondary care.
Factors related to the severity of hand and wrist problems

In our study, we found that a combination of six factors was most strongly associated with the severity of hand and wrist problems. Comparing these findings with other studies is difficult as, to our knowledge, indicators of the severity of hand and wrist problems in primary care have not yet been investigated. Nevertheless, most of the factors we found to be associated with symptom severity have been shown to be of importance in other upper limb disorders, either as predictor of the onset of symptoms, or as predictor of outcome. Not being employed has been described as a determinant of the occurrence of neck and upper limb pain in a population-based study by Walker-Bone et al. [29] and may indicate that poorer socioeconomic status is associated with more severe pain problems.

Higher BMI has frequently been described as a risk factor for the development of osteoarthritis or rheumatoid arthritis, mostly with respect to lower extremity osteoarthritis [30–34]. Data regarding the association of obesity with hand osteoarthritis are conflicting [35]. Some studies did show an association of obesity with hand osteoarthritis [36–39], while other studies did not find any association [40–42]. If indeed there is a relationship between hand osteoarthritis and obesity, other mechanisms than a heavy load on joints are presumably responsible. BMI may also be a marker of other factors that are associated with more severe symptoms, such as poorer general health, poorer socioeconomic status or more distress or depression [43, 44].

High pain intensity and longer symptom duration has been demonstrated to be associated with a poor outcome in most musculoskeletal problems, including shoulder pain [45–47] and tennis elbow [48]. As our outcome measure (SSS) included items on pain intensity it is no surprise that pain intensity showed a strong relation with overall symptom severity. The explained variance of our final model was 55%, which is relatively high. This could very well be caused by the fact that pain intensity was retained in the model. When we excluded pain intensity, the explained variance of the model reduced to 37%.

The fact that worrying was associated with more severe symptoms seems to indicate that psychosocial factors may play a role in hand or wrist problems, either as a cause or as a consequence of pain, as has also been demonstrated for other neck–upper limb disorders. Bot et al. [45] studied predictors of outcome in neck and shoulder complaints, and showed that more worrying at baseline was consistently associated with poorer outcome at follow-up. Few studies have specifically addressed ‘worrying’ as a passive coping strategy in upper limb pain, but general distress has been found to be a predictor of poor outcome in several studies [49–51].

Finally, we found that a diagnosis of nerve entrapment (which includes carpal tunnel syndrome) was strongly associated with the severity of hand and wrist problems. This finding is not unexpected because the SSS has been developed to assess the severity of symptoms in patients with carpal tunnel syndrome, and asks specifically about numbness or tingling sensations in the hand and pain at night time, which are characteristics of nerve entrapment [7]. We chose to use this questionnaire because it was the most appropriate one to assess severity of symptoms in patients with a variety of hand or wrist problems, and showed good psychometric performances in our primary care population [8].

**Strengths and weaknesses**

Previous research has mostly been carried out in secondary care settings focusing on specific hand and wrist diagnoses, whereas our study addressed a large, heterogeneous population of primary care patients and, thereby, reflects wrist and hand problems as they are presented to the GP. The problems were diagnosed by the participating GPs, who had received a 3 h training session before the start of the study. The diagnosis was not confirmed by a specialist. This may have resulted in some diagnostic misclassification, perhaps partly explaining the absence of large differences in diagnostic characteristics between diagnostic categories. However, the main objective of our observational study was to describe

### TABLE 2. Baseline scores stratified by diagnosis according to the GP

<table>
<thead>
<tr>
<th>Baseline scores</th>
<th>Total population</th>
<th>1 Diagnosis (n = 241)</th>
<th>&gt;1 Diagnosis (n = 25)</th>
<th>Rheumatoid arthritis (n = 21)</th>
<th>Osteoarthritis (n = 45)</th>
<th>Tenosynovitis (n = 42)</th>
<th>Nerve entrapment (n = 33)</th>
<th>Ganglion (n = 24)</th>
<th>Repetitive strain injury (n = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>49.3 (16.0)</td>
<td>48.2 (15.8)</td>
<td>59.7 (14.7)</td>
<td>48.9 (14.4)</td>
<td>62.0 (11.3)</td>
<td>48.1 (15.7)</td>
<td>48.7 (16.0)</td>
<td>40.9 (13.8)</td>
<td>37.8 (10.8)</td>
</tr>
<tr>
<td><strong>Gender (% female)</strong></td>
<td>74</td>
<td>72</td>
<td>96</td>
<td>52</td>
<td>80</td>
<td>71</td>
<td>79</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td><strong>SSS</strong></td>
<td>2.1 (0.6)</td>
<td>2.1 (0.6)</td>
<td>2.3 (0.5)</td>
<td>2.5 (0.6)</td>
<td>2.2 (0.5)</td>
<td>2.0 (0.5)</td>
<td>2.5 (0.6)</td>
<td>1.7 (0.3)</td>
<td>2.0 (0.4)</td>
</tr>
<tr>
<td><strong>Pain on an 11-point numerical rating scale</strong></td>
<td>4.0 (2.4)</td>
<td>3.9 (2.4)</td>
<td>4.3 (2.0)</td>
<td>4.9 (2.1)</td>
<td>4.4 (2.2)</td>
<td>4.0 (2.6)</td>
<td>4.3 (2.6)</td>
<td>2.9 (2.3)</td>
<td>3.8 (1.9)</td>
</tr>
</tbody>
</table>

*American College of Sports Position Stand.*
The response to our study was high with 89% of eligible and invited patients consenting to participate. The non-responders were less often female and slightly younger than the responders, which also resulted in a slightly different distribution of diagnoses, with a slightly higher number of patients with rheumatoid arthritis and lower number with osteoarthritis among the non-responders. However, this non-response is unlikely to have affected the reported associations between patient characteristics and severity of symptoms in the population [52]. The GPs were instructed to recruit 10 consecutive patients meeting the eligibility criteria. However, there was considerable variation in the number of patients recruited by GPs. The main reason indicated by GPs for missing eligible patients was busy office hours or simply forgetting about the study. Therefore, we do not expect that the GPs enrolled a highly selective sample. We do not have reliable information to gain insight in the total number of eligible patients in the participating practices. Therefore, we compared gender and age of our sample to patients consulting for hand or wrist problems in the second National Survey of General Practice (NS2) which is a large nation-wide morbidity survey in The Netherlands [53]. Our population consisted of slightly more females and slightly more middle-aged patients. This may be the result of some selective enrolment by GPs, but may also reflect some selective non-response (as described earlier).

Finally, we would like to emphasize that we have used cross-sectional data, and cannot draw conclusions regarding the direction or causality of the reported associations between determinants and severity of hand and wrist problems. Longitudinal research is needed to look more closely at the temporal relationship of these associations.

In conclusion, primary care patients with hand or wrist problems report pain and reduction in function, but the impact on other aspects of perceived health is limited. Severity of the problem seems to be associated with socio-demographic, physical and psychosocial factors, more than with the medical diagnosis given by the GP.
References


