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ORIGINAL ARTICLE

Management in non-traumatic arm, neck and shoulder complaints: differences between diagnostic groups

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Abstract Arm, neck and/or shoulder complaints are common in western societies. In the Netherlands, general practice guidelines are issued on shoulder pain and epicondylitis only. Little is known about actual management of the total range of diagnoses. The objectives of the study are: to determine management in patients consulting the GP with a new episode of non-traumatic arm neck and shoulder complaints up to 6 months after the first consultation. To evaluate differences in management between patients with specific diagnoses versus non-specific diagnoses and between specific diagnostic groups. In a prospective cohort study in general practice. We recruited 682 eligible patients. Data on diagnosis, management, patient- and complaint-characteristics were collected. Co-occurrence of treatment options was presented in scaled rectangles. After 6 months, additional diagnostic tests had been performed in 18% of the patients, mainly radiographic examination (14%). Further, 49% had been referred for physiotherapy and 12% to the medical specialist. Patients with specific diagnoses were more frequently referred for specialist treatment, and patients with non-specific diagnoses for physiotherapy. Corticosteroid injections (17%) were mainly applied specific diagnoses (e.g. impingement syndrome, frozen shoulder, carpal tunnel and M. Quervain). Frequencies of prescribed medication (51%) did not differ between specific and non-specific diagnoses. In 19% of the patients no referral, prescribed analgesics or injection was applied. Braces (4%) were mainly prescribed in epicondylitis. Overall, management most frequently consisted of prescribed analgesics and referral for physiotherapy. Specific and non-specific diagnostic subgroups differed in the frequency corticosteroid injections were applied, and referrals to physiotherapy and to a medical specialist.

Keywords Arm · Neck · Shoulder · Treatment · General practice

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Introduction

Complaints of arm, neck and shoulder are very common in Western societies [21, 29]. In the Netherlands, the 12 months prevalence in the general population has been estimated at 31.4% for neck pain, 30.3% for shoulder pain, 11.2% for elbow pain and 17.5% for wrist or hand pain [21].

The general practitioner (GP) is often consulted for these complaints [12, 21, 22].

Studies in the general population in Norway reported that 45% of the adults with non-inflammatory musculoskeletal pain consulted a GP in the previous 12 months

[12]. In persons with arm, neck and shoulder pain in the Netherlands, this was about 30–40% [21].

Incidence figures in patients (aged 18–64 years) with non-traumatic arm, neck or shoulder complaints in Dutch general practice, reported 97 consultations per 1,000 registered persons annually. This indicates approximately three consultations per week in an average practice with 2,350 patients [10].

Among the prominent factors in patients with musculoskeletal pain associated with consultation of a GP [12, 19] or healthcare in general [8] are: high pain intensity [8, 12], much disability [8], sickness absence [12, 19], long duration of the complaint [12, 19] and widespread pain [12]. Thus, when people feel hindered by their complaints, they are more likely to consult their GP.

To define upper extremity musculoskeletal disorders (not caused by acute trauma or systemic disease) a multidisciplinary consensus was recently reached in the Netherlands. The aim was to help professionals classify patients unambiguously and to improve communication amongst health care workers. Within these complaints, 23 disorders were classified as specific because they were judged as diagnosable disorders by experts [15].

Distinction between diagnostic groups is important if these groups have different prognoses or require different management decisions.

For management in these complaints, guidelines issued by the Dutch College of General Practitioners are only available for patients diagnosed with epicondylitis and shoulder pain [1, 2].

So far, no studies reported on how non-traumatic arm, neck and shoulder complaints are managed after a patient consults his/her GP, nor compared management between different diagnostic groups (such as: shoulder impingement, carpal tunnel syndrome, epicondylitis and non-specific neck-shoulder pain). Therefore, data on management can help to define usual care in these complaints, or may show that there is a large variation in care. This insight may serve as information important for future trials, providing evidence of efficacy of the various treatments used and their cost utility.

Our objectives are: to determine management in patients consulting the GP with a new episode of non-traumatic arm neck and shoulder complaints up to 6 months after the first consultation. To evaluate differences in management between patients with specific diagnoses versus non-specific diagnoses and between specific diagnostic groups.

Methods

Design and setting

The present study was part of a larger prospective cohort study on course and management, which was performed in the Southwestern region of the Netherlands in 21 general practices.

At baseline and after 6 months, data were collected from patients by means of self-administered questionnaires.

The Medical Ethics Committee of the Erasmus Medical Center in Rotterdam approved the study protocol.

Patients

In total, 31 GPs recruited eligible patients from September 2001 through December 2002. Inclusion criteria were: patients who consulted their GP for a new complaint or new episode of complaints of neck, upper back, shoulder, upper arm, elbow, forearm, wrist or hand (age 18–64 years) and able to complete Dutch language written questionnaires. The episode was considered 'new' if patients had not visited their GP for the same complaint during the preceding 6 months. We excluded patients of whom the presented complaint could be explained by a trauma, fracture, malignancy, amputation, prosthesis, congenital defect or previously diagnosed systemic and/or generalised neurological disorder.

Procedures

During the first consultation, patients received from their GP the study-information, an informed consent form, and the baseline questionnaire. A fax was sent by the GP to the investigators with a patient ID number, information on age, gender, diagnosis, recurrence and prognosis.

After the research team received the completed informed consent form and the baseline questionnaire (within 8 weeks), inclusion criteria were verified in the computerised medical records. After inclusion, the follow-up questionnaire was sent from the research centre at 6 months after the first consultation. Data on management and patient and complaint characteristics, were extracted from the self-administered questionnaires.

Measurements

The following variables were measured:

- Patient characteristics: age, gender, educational level and being employed.
- Complaint characteristics: duration of the complaints at the first consultation, musculoskeletal co-morbidity, non-musculoskeletal co-morbidity and recurrence. Furthermore, a complaint was defined as 'regional' or 'multiple regional', based on the area with the most pain or complaints during the last week indicated on a manikin. Three regions were defined: neck-shoulder (including neck, upper part of thoracic spine, shoulder and upper arm), elbow-fore arm and wrist-hand.

A complaint was defined 'multiple regional' when more than one region was indicated. The diagnosis as registered by the treating GP (Appendix) was dichotomised by the researcher into specific or non-specific based on a categorisation by Sluiter et al. [23] and by a consensus procedure [15], where a diagnosis was categorised as specific when it could be attributed to a specific medically objectifiable disorder. When the GP indicated more than one diagnosis, the specific diagnosis was given priority.

– Hindrance: complaints during leisure activities, sports activities and work activities, and sick leave were registered.

Complaint severity was measured on an 11-point numerical rating scale from 0 (no complaints) to 10 (unbearable complaints).

Functional limitations of the arm, neck, shoulder or hand was measured with the Disability of Arm Shoulder and Hand (DASH) questionnaire [14]. Each item was scored on a 5-point Likert scale. Response scores were summed and transferred to a score ranging from 0 (no disability) to 100 (completely disabled).

– Management: Information on diagnostic procedures, consulted care providers and treatment received both at baseline and at 6 months was gathered by self-administered questionnaires. Participants were asked: which care provider did you consult related to this arm, neck or shoulder complaint, how often, and what treatment did you receive. The types of diagnostic procedures, if any, were also registered.

Statistical analyses

Study population

Descriptive statistics were used to present the patient, complaint, symptoms and hindrance for both the total population and the two subgroups of patients with specific or non-specific diagnoses.

Selective non-response and selective dropout among the patients was evaluated using logistic regression analysis (step backward Wald, significance level <0.05) in SPSS version 11.0 (Chicago, IL, USA). The variables on the fax form submitted by the GP (age, gender, specific diagnosis, recurrent complaint and expected prognosis of the GP) were included for the analyses on non-responders, and the baseline variables (Table 1) were used in the analyses on dropouts.

Management

Frequencies on treatment options are presented for both the total population and subsequently grouped per diagnostic category. Differences in distribution of treatment variables between the group with a specific diagnosis and non-specific diagnosis at 6 months were tested using Pearson's Chi-square (two-sided) test $P < 0.05$.

In scaled rectangle diagrams [20] co-occurrence of the four main treatment options are presented for the group with specific diagnoses and non-specific diagnoses, 6 months after the first consultation. Here, co-occurrence implies that different treatments can take place at the same time or after one another within the 6-month study period.

With the exception of the scaled rectangles, all analyses were performed with SPSS, version 11.0 for Windows (SPSS Inc, Chicago, IL, USA).

To produce scaled rectangle diagrams, SPAN software was used. This was downloaded from http://www.auckland.ac.nz/mch/span.

Results

Study population

In total 798 patients fulfilled the criteria of which 682 (85.5%) returned a completed baseline questionnaire and informed consent and entered the cohort. The mean time between consultation and filling in the questionnaire was 2 weeks.

No differences were found between responders and non-responders on distribution of age (18–40 years 50% versus 61%; $P = 0.09$), males (41% versus 44%; $P = 0.31$), specific diagnosis (59% versus 54%; $P = 0.11$), recurrent complaint (28% versus 24%; $P = 0.34$) or poor prognosis according to the GP (32% versus 30%; $P = 0.92$).

Of all 682 participants, 42% was male and the median age was 45 years. The complaints were mainly located at the neck, upper back, shoulder or upper arm (77%), followed by elbow-forearm (25%) and wrist or hand (19%), and involved more than one region in 42%. Most patients reported complaints were pain when active (86%) or in rest (52%) (more than one is possible). About 50% reported complaints during leisure activities, sports or work (Table 1). According to our classification, 59% of the complaints was diagnosed as specific, mostly impingement of the shoulder (Appendix).

Between the specific and non-specific diagnostic subgroups, no differences were found in severity of complaints and functional limitations.

However, in the group with non-specific diagnoses complaints during working activities were reported more frequently, and complaints during sports activities less frequently. Stiffness was more frequently reported in the non-specific group, and loss of strength and coordination

Table 1 Patient characteristics at baseline ($n = 682$)

Variables	Specific diagnoses ($n = 402$)	Non-specific diagnoses ($n = 280$)	Total population ($n = 682$)
Patient characteristics			
Age (18–64 years), median (range)	41 (18–64)	48 (18–64)	45 (18–64)
Male, *n* (%)	184 (46)[b]	99 (36)	283 (42)
Educational level[a]			
Low, *n* (%)	158 (39)	86 (31)	244 (36)
Medium, *n* (%)	141 (35)	102 (37)	243 (36)
High, *n* (%)	103 (26)	91 (32)	194 (28)
Having paid work, *n* (%)	310 (77)	224 (80)	534 (78)
Complaint characteristics			
Duration of the complaint			
0–6 weeks, *n* (%)	189/401 (47)[c]	155 (55)	344/681 (50)
6 weeks to 6 months, *n* (%)	107/401 (27)[c]	55 (19)	162/681 (24)
>6 months, *n* (%)	105/401 (26)	70 (25)	175/681 (26)
Co-morbidity musculoskeletal, *n* (%)	203 (51)	128 (46)	331 (49)
Co-morbidity non-musculoskeletal, *n* (%)	88 (22)	57 (20)	145 (21)
Recurrent complaint, *n* (%)	92 (23)[c]	99 (36)	191 (28)
Region of main complaint[b], *n* (%)			
Neck, upper back, shoulder, upper arm	273 (67)[c]	255 (91)	528 (77)
Elbow or forearm	133 (33)[c]	37 (13)	170 (25)
Wrist or hand	87 (22)[c]	41 (15)	128 (19)
Multiple region complaint, *n* (%)	186 (46)[c]	101 (36)	287 (42)
Specific complaint, *n* (%)	n.a.	n.a.	402 (59)
Symptoms			
Pain when active, *n* (%)	350 (87)	234 (84)	584 (86)
Pain in rest, *n* (%)	200 (50)	153 (55)	353 (52)
Loss of strength, *n* (%)	232 (58)[c]	91 (32)	323 (47)
Stiffness, *n* (%)	141 (35)[c]	152 (54)	293 (43)
Tingling, *n* (%)	98 (24)	74 (27)	172 (25)
Numbness, *n* (%)	77 (19)	63 (23)	140 (21)
Cold feeling shoulder, arm, hand, *n* (%)	61 (15)	52 (19)	113 (17)
Less hand coordination, *n* (%)	75 (19)[c]	34 (12)	109 (16)
Hindrance			
Complaints during leisure activities, *n* (%)	231/401 (58)	144/280 (51)	375/680 (55)
Complaints during sports activities (among participants doing sports, $n = 302$), *n* (%)	108/182 (59)[c]	61/120 (51)	169/302 (56)
Complaints during working activities (among working population, $n = 534$), *n* (%)	172/310 (56)	142/223 (63)	315/533 (59)
Related sick leave in past 6 months (working population, $n = 534$), *n* (%)	55/310 (18)[c]	72/224 (32)	127/534 (24)
Severity of complaints (0–10), mean (SD)	5.6 (2.0)	6.0 (1.9)	5.8 (2.0)
Functional limitations, DASH (0–100), mean (SD)	38.7 (19.0)	34.1 (18.2)	36.8 (18.8)

SD Standard Deviation, *n* number of patients, *n.a.* not applicable, *DASH* disability of arm, shoulder and hand questionnaire

[a] Educational level: low, no education; primary school or lower vocational school; medium, lower or higher general secondary school level or middle vocational school; high, higher vocational school or university

[b] More than one region is possible

[c] Different distribution between the two subgroups. Pearson's Chi-square tested (two-sided), P value <0.05

less frequently compared to the specific group. Further, the complaints are more frequently located in the neck-shoulder region compared to the specific group, and the elbow-forearm and wrist-hand region were less frequently involved. In non-specific diagnoses, complaints are more frequently recurrent. Additionally, distribution of duration

of complaints differed and the percentage women was higher in the non-specific group.

Selective dropout

For 603 participants data on treatment were available at both baseline and 6 months (88.4%).

Being a dropout was significantly related to younger age (18–44 years) (odds ratio 2.8, 1.7–4.7) and being a male (odds ratio 1.9, 1.2–3.0).

Additional diagnostic tests

At baseline, 9% of the patients reported that additional diagnostic tests (additional to history and physical examination) were performed, which was doubled after 6 months (Table 2). The diagnostic procedures were mainly radiographic examinations (14%), followed by laboratory tests (6%) and EMG analysis (4%). No differences were found between the subgroups with specific versus non-specific diagnoses (Pearson $\chi^2 = 0.73$). In the specific diagnoses group EMG analysis was most frequently applied in patients with carpal tunnel syndrome. In specific diagnostic groups in the forearm and wrist/hand region radiology was applied in 17–30%.

Referral

Of all the consulters, 26% reported to be referred at baseline, increasing up to 55% after 6 months. After 6 months, 49% was referred for physiotherapy and 12% to a medical specialist, mostly an orthopaedic surgeon (6%) or a neurologist (5%) (Table 3).

Patients with a non-specific diagnosis were more frequently referred to a physiotherapist (Pearson $\chi^2 < 0.0001$) and patients with a specific diagnosis were more frequently referred to a medical specialist (Pearson $\chi^2 = 0.014$). Though the largest group, subacromial impingement has the largest referral rates to specialist care; in percentages carpal tunnel syndrome and cervical hernia score relatively the highest referral rates. Furthermore, 50% of the patients diagnosed with epicondylitis were referred for physiotherapy, 6 months after the first consultation. In other specific diagnostic groups concerning tendon complaints, figures from 40–54% were reported.

In the group diagnosed with osteoarthritis of elbow/wrist/hand, no referrals were made to a medical specialist.

Medication and braces

At baseline, 35% received analgesics (paracetamol/NSAID), 10% a corticosteroid injection and 1% a brace. After 6 months, 51% prescribed analgesics, 17% had received a corticosteroid injection and 4% a brace (Table 4). Injections were more frequently applied in specific diagnoses (Pearson $\chi^2 < 0.00001$). The highest percentages were found in impingement syndrome, frozen shoulder, carpal tunnel syndrome and M. Quervain. Between specific and non-specific diagnoses no significant difference (borderline) was found in medication use (Pearson $\chi^2 = 0.057$). Braces were mostly applied in specific diagnoses (Pearson $\chi^2 = 0.006$), mainly in epicondylitis.

Co-occurrence of different treatment options

The four most frequently reported treatment options up to 6 months (treatment by a physiotherapist, medical specialist, prescription of analgesics or corticosteroid injection) are presented in scaled rectangle diagrams for the group with non-specific diagnoses (Fig. 1) and with specific diagnoses (Fig. 2). In the non-specific group, 21% received none of the four options, 46% received one option and 33% more than one option, mainly medication in combination with physiotherapy. In the specific group, 17% received none of the four options, 43% received one option and 40% more than one option, mainly analgesics in combination with physiotherapy. Though the percentages are similar, the specific group shows more corticosteroid injections in combination with more referrals to a medical specialist. On the whole, 112 patients (19%) did not receive any of the four options within 6 months.

Discussion

Management

Management of non-traumatic arm, neck and shoulder complaints presented in general practice up to 6 months after the first consultation mainly consisted of prescribed analgesics (51%) and referral to physiotherapy (49%), followed by corticosteroid injections (17%) and referral for medical specialist care (12%). In 19% of the patients none of these options was applied.

Medical care in general, will most likely match the diagnosis [30] and the expected corresponding natural course [9]. From the distribution of the management options in patients diagnosed with impingement and frozen shoulder, it seems that management is in accordance with the Dutch guideline [2] that recommends a stepwise approach: i.e. information and wait and see, analgesics (ideally: paracetamol; NSAID as second line intermittently if no contraindications exist), followed by corticosteroid injections and, if functional limitations are still present after 6 weeks referral for exercise therapy. Studies on cost

Table 2 Additional diagnostic tests at baseline, and from baseline to 6 months follow-up

GP diagnosis at first consultation	Additional diagnostic tests							
	None		Radiology		Lab		EMG	
	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)
Non-specific	250/280 (89)	202/248 (82)	21/280 (8)	36/248 (15)	9/280 (3)	16/248 (7)	3/280 (1)	6/248 (2)
Specific total	373/402 (93)	293/355 (83)	24/402 (6)	49/355 (14)	7/402 (2)	20/355 (6)	4/402 (1)	15/355 (4)
Subacromial impingement syndrome + biceps tendinoses	210/222 (95)	167/196 (85)	11/222 (5)	25/196 (13)	3/222 (1)	10/196 (5)	0/222 (0)	2/196 (1)
Lateral/medial epicondylitis	90/93 (97)	75/82 (92)	2/93 (2)	5/82 (6)	1/93 (1)	2/82 (2)	1/93 (1)	1/82 (1)
Osteoarthritis elbow/wrist/hand	12/16 (75)	11/14 (79)	4/16 (25)	3/14 (21)	0/16 (0)	0/14 (0)	0/16 (0)	0/14 (0)
Peritendinitis/tenosynovitis flexors/ extensors forearm	13/13 (100)	10/13 (77)	0/13 (0)	3/13 (23)	0/13 (0)	2/13 (15)	0/13 (0)	1/13 (8)
Quervain's syndrome	12/13 (92)	7/10 (70)	1/13 (8)	3/10 (30)	1/13 (8)	2/10 (20)	0/13 (0)	1/10 (10)
Carpal tunnel syndrome	7/11(64)	3/11 (27)	2/11 (18)	3/11 (27)	1/11 (9)	2/11 (18)	3/11 (27)	7/11 (64)
Frozen shoulder	8/9 (89)	6/8 (75)	1/9 (11)	2/8 (25)	0/9 (0)	1/8 (13)	0/9 (0)	0/8 (0)
Cubital tunnel + Guyon's tunnel + radial tunnel syndrome	6/8 (75)	4/6 (67)	1/8 (13)	1/6 (17)	1/8 (13)	1/6 (17)	0/8 (0)	1/6 (17)
Cervical hernia	3/5 (60)	3/5 (60)	2/5 (40)	2/5 (40)	0/5 (0)	0/5 (0)	0/5 (0)	1/5 (20)
Other[a]	12/12 (100)	7/10 (70)	0/12 (0)	2/10 (20)	0/12 (0)	0/10 (0)	0/12 (0)	1/10 (10)
Total	623/682 (91)	495/603 (82)	45/682 (7)	85/603 (14)	16/682 (2)	36/603 (6)	7/682 (1)	21/603 (4)

[a] Free body of wrist or hand (1) Raynaud's phenomenon and peripheral neuropathy in combination with exposure to hand-arm vibration (1), Trigger finger (2), ganglion (5), bursitis elbow (3)

Table 3 Referrals at baseline, and from baseline to 6 months follow-up

GP diagnosis at first consultation	Referral to					
	None		Physiotherapy		Medical specialist	
	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$(%)	Up to 6 months $n = 603$(%)
Non-specific	191/280 (68)	94/248 (38)	85/280 (30)	148/248 (60)	7/280 (3)	21/248 (9)
Specific total	312/402 (78)	176/355 (50)	73/402 (18)	150/355 (42)	24/402 (6)	54/355 (15)
Subacromial impingement syndrome + biceps tendinoses	177/222 (80)	95/196 (49)	38/222 (17)	83/196 (42)	11/222 (5)	25/196 (13)
Lateral/medial epicondylitis	68/93 (73)	38/82 (46)	23/93 (25)	41/82 (50)	3/93 (3)	5/82 (6)
Osteoarthritis elbow/wrist/hand	16/16 (100)	13/14 (93)	0/16 (0)	1/14 (7)	0/16 (0)	0/14 (0)
Peritendinitis/tenosynovitis flexors/ extensors forearm	11/13 (85)	5/13 (39)	2/13 (15)	7/13 (54)	0/13 (0)	4/13 (31)
Quervain's syndrome	12/13 (92)	5/10 (50)	1/13 (8)	4/10 (40)	0/13 (0)	1/10 (10)
Carpal tunnel syndrome	5/11 (46)	3/11 (27)	2/11 (18)	2/11 (18)	4/11 (36)	8/11 (73)
Frozen shoulder	6/9 (67)	3/8 (38)	3/9 (33)	5/8 (63)	1/9 (11)	2/8 (25)
Cubital tunnel + Guyon's tunnel + radial tunnel syndrome	4/8 (50)	2/6 (33)	2/9 (25)	2/6 (33)	2/8 (25)	2/6 (33)
Cervical hernia	3/5 (60)	1/5 (20)	2/5 (40)	4/5 (80)	1/5 (20)	3/5 (60)
Other[a]	10/12 (83)	5/10 (50)	0/12 (0)	1/10 (10)	2/12 (17)	4/10 (40)
Total	503/682 (74)	270/603 (45)	158/682 (23)	298/603 (49)	31/682 (5)	75/603 (12)

[a] Free body of wrist or hand (1) Raynaud's phenomenon and peripheral neuropathy in combination with exposition to hand-arm vibration (1), trigger finger (2), ganglion (5), bursitis elbow (3)

effectiveness in shoulder pain, favoured injection over physiotherapy [16].

In epicondylitis a similar approach is recommended; information and wait and see, followed by analgesics or corticosteroid injections if pain hinders function. In the present study, 46% of the patients was prescribed medication.

In the present study, 50% of the patients was referred for physiotherapy although there is no explicit recommendation for physiotherapy in the guideline [1]. Additionally, cost effectiveness studies, concluded no preference for physiotherapy over a brace [25], and no preference for physiotherapy or corticosteroid injections over 'wait and see' [18]. Reasons for the large percentage of referral may be that obvious options do not give the desired results. Besides, patient's circumstances and preferences may play a role as well [13].

The low percentages of additional diagnostic tests in specific shoulder diagnoses and epicondylitis, seem in line with the practice guidelines, where additional diagnostic tests are not recommended (unless in case of deviating course or severe pathology) because the results have no consequences for management [1, 2].

The results of management in the small group with CTS ($n = 11$), seems to be in line with a Dutch multidisciplinary guideline published after our study closed [7]. In which is noted that a probability diagnosis of CTS can be stated in primary care based on information from history taking, and the GP can start matching treatment. Referral to secondary care is advised when complaints persist. For this relatively small group special treatment or confirmation from a medical specialist seems to be preferred.

Regarding the prescription of analgesics, we could not always distinguish between paracetamol and NSAIDs from our own data. Data from the second Dutch national survey of general practice, based on the International Classification of Primary Care, demonstrated that in many musculoskeletal complaints (ranging from shoulder complaints, arm symptoms, elbow complains, wrist and hand complaints, cervical syndromes, shoulder syndromes, epicondylitis), diclofenac is the most frequently prescribed medication [6]. Despite the rationale behind the choice for NSAIDs, analgesic potential and their inflammatory action, so far no studies evaluated the effectiveness of NSAIDs versus paracetamol (acetaminophen) or additional to paracetamol in non-traumatic arm, neck and shoulder complaints. In 1995, a review on NSAIDs in shoulder complaints already pointed out that future studies should establish whether the use of NSAIDs is more favourable than simple analgesics, especially in the light of the higher risk of adverse reactions from NSAIDs [26].

Table 4 Management at baseline, and from baseline to 6 months follow-up

GP diagnosis at first consultation	Overall treatment							
	None		Prescribed medication		Corticosteroid injection		Brace	
	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)	At baseline $n = 682$ (%)	Up to 6 months $n = 603$ (%)
Non-specific	190/280 (68)	125/248 (50)	84/280 (30)	116/248 (47)	7/280 (3)	15/248 (6)	0/280 (0)	4/248 (2)
Specific total	202/402 (50)	112/355 (32)	151/402 (38)	194/355 (54)	64/402 (16)	87/355 (25)	5/402 (1)	22/355 (6)
Subacromial impingement syndrome + biceps tendinoses	97/222 (44)	48/196 (25)	92/220 (41)	119/196 (61)	48/222 (22)	61/196 (31)	0/222 (0)	3/196 (2)
Lateral/medial epicondylitis	57/93 (61)	33/82 (40)	30/93 (32)	38/82 (46)	5/93 (5)	13/82 (16)	2/93 (2)	13/82 (16)
Osteoarthritis elbow/wrist/hand	9/16 (56)	8/14 (57)	6/16 (38)	5/14 (36)	3/16 (19)	1/14 (7)	0/16 (0)	0/14 (0)
Peritendinitis/tenosynovitis flexors/ extensors forearm	8/13 (62)	6/13 (46)	4/13 (31)	6/13 (46)	0/13 (0)	0/13 (0)	1/13 (8)	1/13 (8)
Quervain's syndrome	6/13 (46)	2/10 (20)	3/13 (23)	5/10 (50)	4/13 (31)	4/10 (40)	0/13 (0)	0/10 (0)
Carpal tunnel syndrome	8/11 (73)	5/11 (46)	1/11 (9)	3/11 (27)	2/11 (18)	3/11 (27)	1/11 (9)	2/11 (18)
Frozen shoulder	1/9 (11)	1/8 (13)	6/9 (67)	6/8 (75)	2/9 (22)	4/8 (50)	0/9 (0)	0/8 (0)
Cubital tunnel + Guyon's tunnel + radial tunnel syndrome	5/8 (63)	2/6 (33)	3/8 (38)	4/6 (67)	0/8 (0)	0/6 (0)	1/8 (13)	2/6 (33)
Cervical hernia	2/5 (40)	2/5 (40)	3/5 (60)	3/5 (60)	0/5 (0)	1/5 (20)	0/5 (0)	1/5 (20)
Other[a]	9/12 (75)	5/10 (50)	3/12 (25)	5/10 (50)	0/12 (0)	0/10 (0)	0/12 (0)	0/10 (0)
Total	392/682 (58)	237/603 (39)	235/682 (35)	310/603 (51)	71/682 (10)	102/603 (17)	5/682 (1)	26/603 (4)

[a] Free body of wrist or hand (1) Raynaud's phenomenon and peripheral neuropathy in combination with exposition to hand-arm vibration (1), Trigger finger (2), ganglion (5)

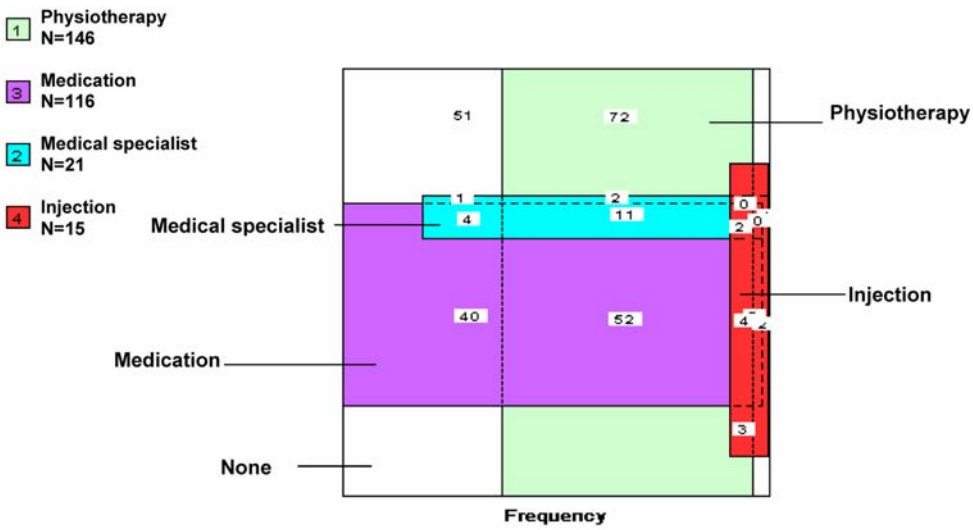

Fig. 1 Non-specific diagnoses and treatment up to 6 months after the first GP consultation

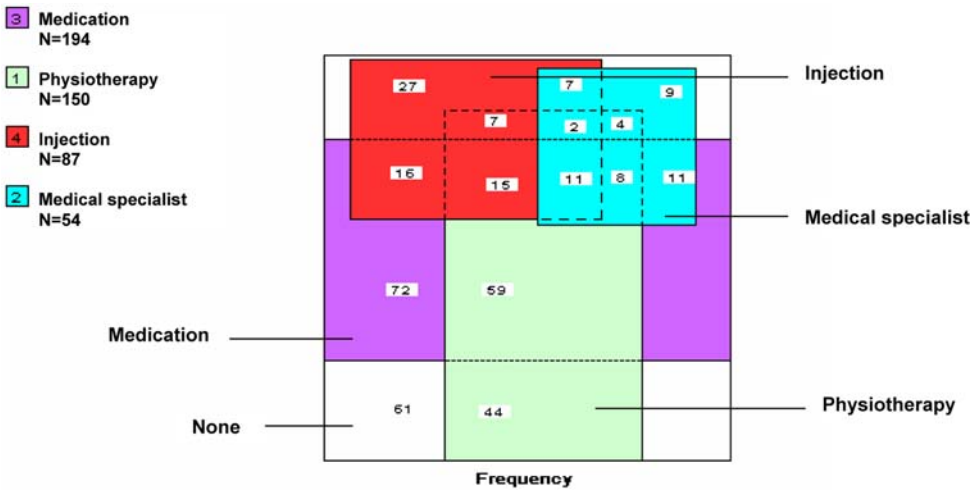

Fig. 2 Specific diagnoses and treatment up to 6 months after the first GP consultation

Karels et al. evaluated the contents of physical therapy treatment in patients with non-traumatic arm, neck and shoulder complaints. They reported that most patients were treated with exercise therapy (93%), massage (87%) or a combination of both. In 30% of the patients, the treatment included physical modalities (such as ultrasound), and in 20% of the patients treatment included manipulation techniques [17].

Differences in management

Differences between the specific and non-specific diagnostic groups, on the distribution of referral to a medical specialist, was mainly due to specific diagnoses of forearm, wrist and hand. This may be for confirmation of the diagnosis, non-conservative treatment or reassuring the patient, but we have no data to verify this hypothesis.

The application of corticosteroid injections, mainly in specific shoulder diagnoses, is according to the practice guideline. However, the effect of the application of corticosteroid injections in epicondylitis, shoulder pain and carpal tunnel syndrome, seems to be mainly restricted to short term relief of symptoms [3, 5, 24].

For the largest subgroup with 'non-specific diagnoses' in arm, neck, and shoulder, no guidelines are available. That patients with non-specific diagnoses are more frequently referred for physiotherapy than patients with specific diagnoses, seems in line with the distribution of the diagnoses in a cohort study in physiotherapy practice where the majority of the study population were patients with non-specific diagnoses [17].

However, a Cochrane review reported only limited evidence for the effectiveness of exercises in patients with chronic non-specific neck and shoulder complaints [28].

Variance within a certain diagnostic group may (partly) be explained by differences in hindrance, as mentioned in both guidelines for epicondylitis [1] and shoulder pain [2]. Another reason may be lack of solid evidence in favour of one of the studied treatment options in the total range of non-traumatic arm, neck and shoulder complaints. Although there is limited or short term effect (mainly short-term pain relief) of some of the treatment options, solid evidence in favour of any one of the studied treatment options in this population lacks [27]. The lack of clear evidence of effective treatments may leave more room for personal preferences of both GP and patient.

Besides, patient- and other complaint-characteristics, such as age, employment or psychosocial factors may lead to differences in management decisions as well. These factors probably contribute to the GP's prognosis [11], which may influence management. Therefore, we checked the univariate association of the 6-months prognosis according to the GP with the five different management options. Poor GP-prognosis showed a positive association with additional diagnostic tests (OR 2.7; 1.7–4.6) and with referral for physiotherapy (OR 2.1; 1.5–3.0). The association with referral for medical specialist care (OR 1.6; 0.7–3.5) was not significant. Besides the low OR, the prevalence of the outcome was also low. Prescription of medication (OR 1.1; 0.9–1.5) and application of corticosteroid injection (OR 0.9; 0.6–1.1), however, did not show a relation with the expected prognosis. This is in line with short-term relief of symptoms as treatment goal in these options.

Strengths and the limitations of this study

This is the first study to compare the management of different diagnostic groups in non-traumatic arm, neck and shoulder complaints. Some of the diagnostic subgroups are large (e.g. shoulder complaints and epicondylitis) and others are very small, reflecting everyday clinical practice [4, 10]. Therefore, the reported management mainly represents these larger diagnostic subgroups.

In the present study, we used the diagnosis registered at the first consultation. However, in some cases the initial diagnosis may have changed after time; due to difficult differential diagnostics within the limited consultation time or the need for additional diagnostic tests, or true changes [30], what may affect the therapeutic approach. Because of this, and the fact that the diagnosis was realised in a non-standardised manner, we cannot rule out some misclassification. This may have resulted in less contrast between the specific and non-specific group.

In the present study, 15 out of the 682 participants received two diagnoses of whom 8 participants received two specific diagnoses within the same region, which may indicate difficult differential diagnostics. Besides, seven participants were diagnosed with both impingement syndrome and a specific forearm diagnosis (epicondylitis/tendonitis/carpal tunnel syndrome). We chose to work with the most centrally located diagnosis, here impingement syndrome.

Due to the response time of 8 weeks, in 21% of the patients the data on management at baseline were not restricted to a single consultation.

Another issue was that the follow-up questionnaire referred to the previous 6 months. We accounted for possible overlap of treatment options due to recollection of information by reporting 'management up to 6 months'.

In the small group that is referred to a medical specialist, part of the reported decisions on management may be made on the specialists' own initiative.

A recent development in the Netherlands is that since January 2006, patients no longer need a referral for physiotherapy. This may have implications for the overall treatment in the future.

Conclusions

In non-traumatic arm, neck and shoulder complaints, analgesics and referral for physiotherapy were the treatment options most frequently used, followed by corticosteroid injections and referral for medical specialist care. Patients with a non-specific diagnosis were more frequently referred for physiotherapy and less frequently to a medical specialist compared to patients with a specific diagnosis. Corticosteroid injections were mainly applied in specific diagnoses (e.g. impingement syndrome, frozen shoulder, carpal tunnel and M. Quervain).

Future intervention studies could provide evidence of effective treatments, especially for the large group of non-specific diagnoses, mainly located at the neck-shoulder region. Others may help to clarify the influence of variables, other than diagnoses, on the variance in management decisions between and within diagnostic groups.

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Appendix

Table 5

Table 5 Appendix: The diagnoses included in the present study

Diagnoses	Number of patients
Specific complaints included in this study	
Cervical hernia	5
Subacromial impingement syndrome (rotator cuff syndrome, tendinoses, bursitis)	220
Frozen shoulder	9
Biceps tendinosis	2
Lateral/medial epicondylitis	93
Bursitis elbow	3
Osteoarthritis of elbow (no Rheumatoid arthritis)	2
Cubital tunnel syndrome	2
Peritendinitis/tenosynovitis flexors/extensors forearm	13
Quervain's syndrome	13
Guyon's tunnel syndrome	5
Radial tunnel syndrome	1
Carpal tunnel syndrome	11
Osteoarthritis of wrist or hand (no Rheumatoid arthritis)	14
Free body of wrist or hand	1
Raynaud's phenomenon and peripheral neuropathy in combination with exposure to hand-arm vibration	1
Trigger finger	2
Ganglion	5
Non-specific complaints	
All other arm, neck and shoulder complaints not attributable to trauma or systemic diseases	280

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