



Acute shoulder pain in primary care

An observational study

BACKGROUND

Shoulder pain is a common presentation in general practice. Data on prognosis, treatment and compliance for acute shoulder pain are lacking but would be valuable for guiding decision making. This study collected data on acute shoulder pain and its outcome over 6 months.

METHODS

A prospective observational study of 100 acute shoulder pain patients from 21 general practices in southeast Queensland.

RESULTS

Disability levels at presentation were the best predictor of outcome at 6 months. Patients who had not fully recovered at 6 months had higher risk of depression at presentation. The biggest improvements in pain and disability scores occurred in the first month of management, with almost 60% of patients fully recovered at 6 months. Over 40% of patients had at least one radiological investigation for their pain.

DISCUSSION

Measuring disability, pain and mood levels in acute shoulder pain patients gives the best prognostic data. The use of radiological investigations may be higher than is clinically necessary. Early multimodal management of acute shoulder pain patients needs consideration.

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Shoulder pain is a common presentation in general practice, with approximately 1% of adults consulting a general practitioner with new shoulder pain annually.¹ The 1 month period prevalence of shoulder pain is 16%.² A 2005 BEACH report indicated that 0.8% of all patient encounters in general practice were due to shoulder pain.³ Just 50% of new episodes of shoulder disorders recover within 6 months⁴ rendering it a condition with likely long term consequences. The condition is associated with impaired physical and psychosocial functioning.⁵

Risk factors for persistent shoulder pain include longer duration of symptoms, gradual onset of pain, high pain severity at presentation, gender (female) and age (>60 years).⁶⁻⁸ Early identification of patients who are most at risk of persistent pain appears to be a key factor in minimising morbidity, and may result in better targeting of treatment.⁹

The aims of the current study were to describe the clinical course of acute shoulder pain (ASP) by measuring

outcomes at 1, 3 and 6 months, identify the factors that predict persistence of symptoms, identify the resources used in management, and investigate adherence to management by patients.

Methods

Design

The study was a prospective, observational study in the primary care setting. Patients ≥ 18 years with ASP were recruited by GPs at 21 general practices in southeast Queensland between August 2004 and March 2005. Acute shoulder pain was defined as pain of 12 weeks duration or less where the centroid of pain was located between the deltoid insertion and medial aspect of the acromioclavicular joint. The pain had to be exacerbated by active or passive shoulder movements with no indication of shoulder problems in the previous 12 months. Patients whose ASP was due to fracture, inflammatory arthritis, polymyalgia rheumatica, gross structural or neurological abnormalities of the shoulder or clinical features consistent with potentially serious disease (eg. cancer)

were excluded. General practitioners obtained consent from patients and collected initial data. Within 1 week, patients were interviewed via telephone and followed up by telephone at 1, 3 and 6 months. The University of Queensland Medical Research Ethics Committee granted ethical approval for the study.

Outcome measures

The primary outcome measure was the shoulder pain and disability index (SPADI)¹⁰ which combines a disability subscale and pain intensity subscale. The pain and disability subscales and SPADI scores range from 0 (no difficulty) to 100 (maximum difficulty). Recovery was defined as SPADI ≤ 10 .

Predictor variables

Sociodemographic variables measured were age, gender and smoking status. Clinical characteristics included duration of symptoms, aetiology and diagnosis, history of shoulder pain, investigations performed, treatments recommended and GPs' estimated time to resolution. Diagnoses were recorded as free text and were subsequently categorised by consensus by three investigators. The study included a screening tool for depression,¹¹ administered at each time point. Data were gathered on treatments used, occupational and recreational activity, and compliance with treatment.

Statistical analysis

Data were analysed using SPSS version 14.0. Nonparametric tests (Cohran's Q, Friedman, McNemar) were used for assessing changes in variables with skewed distributions or nominal/ordinal scales of measurement. Mann-Whitney U and Chi-square tests were used to examine relationships between predictors and outcomes. Regression analysis was used to determine the proportion of variance in outcomes explained by predictors that emerged as associated in bivariate analyses.

Results

General practitioners recruited 100 patients. Of these patients, 97 were interviewed at baseline. Eighty-six patients were interviewed at 1 month, 89 at 3 months, and 89 patients provided data for the 6 month follow up. There were no

significant differences between the responders and dropouts based on baseline age, gender, disability or pain. Four diagnostic categories were delineated: rotator cuff syndromes (supraspinatus tendinitis/tendinosis, painful arc, impingement and subacromial bursitis), pathology of the glenohumeral joint (frozen shoulder syndrome, adhesive capsulitis and osteoarthritis), pathology of other structures (acromioclavicular joint pain and bicep tendon disorders), and nonspecific diagnoses.

Clinical course

Figure 1 shows that after one month, 30% of patients reported a SPADI ≤ 10 (indicating recovery). This increased to 48 patients (57%) at 6 months. There was a significant improvement in pain ($\chi^2=59.6$, $df=3$, $p<0.0001$) and disability ($\chi^2=57.4$, $df=3$, $p<0.0001$) over the study period (Figure 2). The most significant improvements were observed between baseline and 1 month in pain (mean change=17.2, $SD=27.9$, $p<0.001$) and disability (mean change=12.4, $SD=25.8$, $p<0.001$). The differences in mean disability and pain scores for the sample between 3 and 6 months were not significant.

Predictors of outcome

SPADI

With one exception, there was no relationship between the predictor variables and SPADI. Depressed mood was more common in those who were not recovered (Figure 3), and improved over time ($Q=18.6$, $df=3$, $p<0.001$). A preponderance of depressed mood in those not recovered compared to those recovered was found at 1 month ($\chi^2=9.6$, $df=1$, $p=0.002$), 3 months ($\chi^2=16.5$, $df=1$, $p<0.001$) and 6 months ($\chi^2=14.2$, $df=1$, $p<0.001$). Those with SPADI >10 at 6 months had higher risk of depression at baseline ($Z=-2.9$, $p=0.004$), one ($Z=-3.2$, $p=0.001$) and six ($Z=-3.7$, $p<0.001$) months.

Pain

Patients with baseline pain >10 reported greater use of analgesia ($Z=-2.0$, $p=0.04$) and higher rate of specialist referral ($Z=-2.0$, $p=0.044$) than those with pain ≤ 10 , and older patients reported higher pain scores at 3 months ($Z=-2.1$, $p=0.036$). The presence

or absence of depression risk in those with pain scores <10 was compared to those with scores >10 . Depressed mood was higher in those with pain >10 at 1 month ($\chi^2=7.1$, $df=1$, $p=0.008$), 3 months ($\chi^2=12.5$, $df=1$, $p<0.001$) and 6 months ($\chi^2=20.1$, $df=1$, $p<0.001$). At 6 months, patients with pain >10 had an increased risk of depression at baseline ($Z=-2.7$, $p=0.006$), 1 month ($Z=-3.0$, $p=0.003$), 3 months ($Z=-2.0$, $p=0.049$) and 6 months ($Z=-4.5$, $p<0.0001$).

Disability

The only predictor variable whose level differed between the recovered (disability ≤ 10) and the not recovered group (disability >10) at 6 months was age, with the latter group being older by 8 years. Mood and disability were strongly related. Again, depressed mood was higher in those with disability scores >10 at 1 month ($\chi^2=5.4$, $df=1$, $p=0.02$), 3 months ($\chi^2=17.1$, $df=1$, $p<0.001$) and 6 months ($\chi^2=15.2$, $df=1$, $p<0.001$).

The degree to which depression persisted over 6 months was estimated by summing the individual mood scores for each time point. This new variable was entered into a regression analysis, and predicted a substantial proportion of variance in SPADI (Adj $R^2=0.26$, $F_{(1,77)}=28.2$, $p<0.001$), pain (Adj $R^2=0.28$, $F_{(1,77)}=32.2$, $p<0.001$) and disability (Adj $R^2=0.21$, $F_{(1,77)}=21.4$, $p<0.001$). Data also indicated that pain scores at 6 months were only moderately associated with pain scores at baseline ($r=0.32$, $p=0.003$). The association between disability at baseline and 6 months was stronger ($r=0.4$, $p<0.001$).

Management of acute shoulder pain

The proportions of patients using active treatment (ie. any medical or therapeutic intervention) fell significantly between baseline (94%) and 6 months (51%) (OR=14.7, CI=4.6–47.2, $p<0.001$). The decrease was significant between baseline and 1 month (74%) (OR=7.3, CI=2.2–24.5, $p<0.001$), insignificant between 1 and 3 months (64%) (OR=1.8, CI=0.8–3.9, $p=0.09$) and significant between 3 and 6 months (OR=2.2, CI=1.0–4.8, $p=0.03$). Although half of the patients were still using treatments at 6 months, there was also a reduction in the quantity of treatments being

used ($\chi^2=31.1$, $df=1$, $p<0.001$). At 6 months, 22% were using one treatment, 22% used two treatments and 2% used three and four treatments. Analgesia and exercise were the most common treatments at baseline. Exercise and physiotherapy were the most common modalities at 6 months (Figure 4).

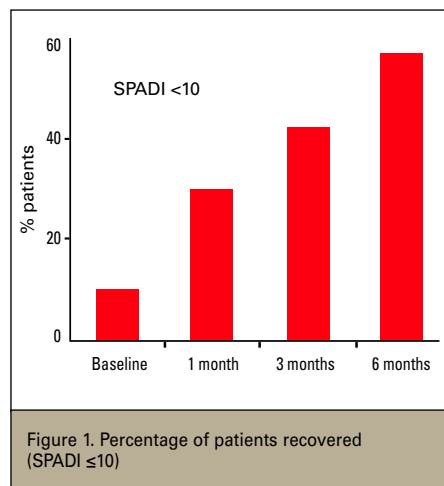


Figure 1. Percentage of patients recovered (SPADI ≤10)

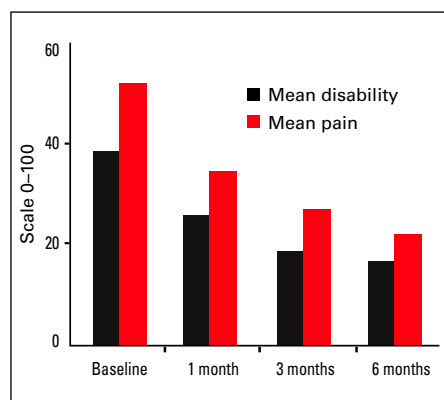


Figure 2. Mean levels of disability and pain at each time point

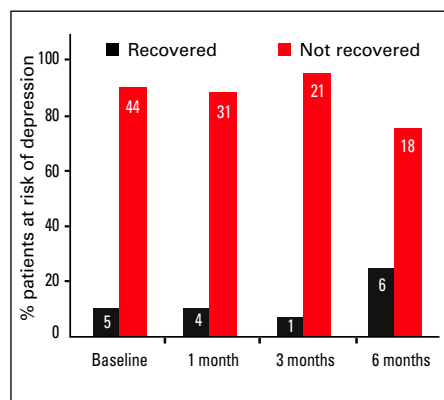


Figure 3. Recovery status of all patients with depressed mood at each time point

Compliance

Compliance with treatments was high and did not emerge as higher for one treatment over another, with approximately 90% full or partial compliance across treatments and time points. Figures 5 and 6 present the compliance rates at baseline and 1 month. Compliance did not relate to any predictors in the study.

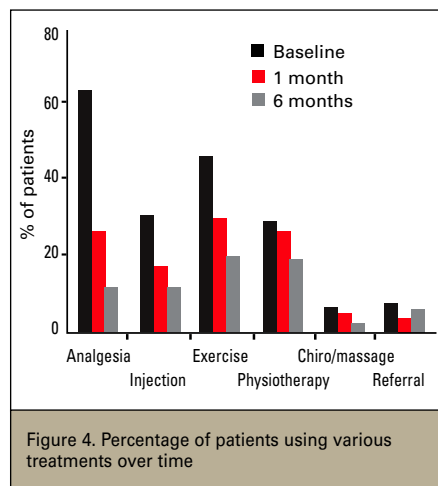


Figure 4. Percentage of patients using various treatments over time

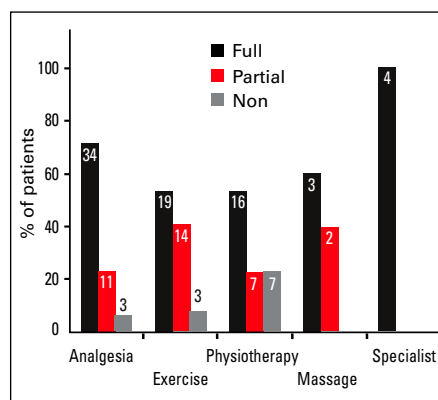


Figure 5. Percentage (n) of patients complying with prescribed treatments at baseline

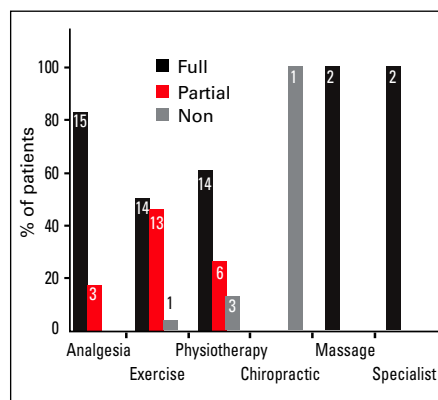


Figure 6. Percentage (n) of patients complying with prescribed treatments at 1 month

Discussion

This study found significant improvements in pain/disability for ASP patients treated by GPs in southeast Queensland. The largest improvements occurred in the first month of management. Patients continued to recover up to 6 months at a diminishing rate, at which time just under 60% were fully recovered (SPADI ≤10). This compares favourably with other studies.^{3,12}

Data suggested that disability at presentation is a better predictor of long term outcome than pain. Supporting the findings of other studies, there was a strong link between disability/pain and mood, the latter relationship emerging as the stronger. Risk of depression was significantly lower in those who had recovered. While it was not possible to determine causality, the results suggest that it would be prudent to observe and manage mood in ASP patients given its link with pain and recovery status. The two item mood test used in our study is apposite for use in general practice¹¹ and may alert practitioners to consider psychological interventions and/or antidepressants early in the management program. Psychological therapies/referral in at risk patients needs to form part of multimodal management in future efficacy trials on acute shoulder pain management.

Multimodal therapy combines treatments simultaneously rather than using monotherapies sequentially, and has been successful in the management of low back pain.^{13,14} This study did not detect a difference in outcome based on the number of treatments used, however more than half of the patients were using two or more treatments concurrently. Determining the best combination of treatment was beyond the scope of the study. It is suggested that by recording pain/disability scores, patients with initially high scores or who show minimal recovery at 1 month could be offered multimodal management (assuming early intervention using a combination of treatments is most beneficial), thus preventing patients from ‘falling through the gaps’. A simplified version of SPADI could encourage its routine uptake in primary care. An alternative method is to identify tasks the patient was formerly able to perform and track capacity for returning to these tasks (a ‘recoverygram’)¹⁵ to provide a snapshot of recovery status.

The number of radiological investigations in this study was high. Over 40% of patients had at least one test. Australian data have recorded a 15–25% rate of imaging for shoulder pain in general practice.^{16,17} However, increased use of radiological intervention does not appear to improve outcomes,¹² calling into question the practice of routine ordering of plain films and ultrasound.¹⁸ Recent guidelines for acute musculoskeletal pain advise that imaging does not alter management in acute mechanical conditions and should be reserved for use in red flag conditions.¹⁹ Wider promulgation of guidelines, preferably in small group discussion, needs to be considered.

There were some limitations to this study. Data were not collected on all comorbidities that may have affected outcomes, such as diabetes. Diagnostic categories were not predefined, making the four categories used in this study relatively arbitrary. It did, however, reflect the terms that GPs currently use to describe their patients. No correlation was attempted between radiological investigations and presenting symptoms. This information may have been useful for understanding GPs' decision making in this regard. In any case, this study identifies a number of issues that warrant further research. It would be worth investigating the mood and disability/pain relationship, particularly to determine if depressed mood hampers recovery. A randomised trial is required to compare the efficacy of various traditional and novel treatments, and the moderating effects of initial pain and disability levels. Multimodal management, such as close supervision of exercise programs with manual therapy, oral analgesia, focal injections and mood management, warrants further investigation. Reliable guidelines on the optimal treatment according to baseline clinical features would be highly beneficial to GPs.

Implications for general practice

- Acute shoulder pain presentations to general practice are at risk of not reaching full recovery by 6 months.
- Measuring pain/disability/mood at presentation gives practitioners the best guide to prognosis.
- Patients at risk or who are slow to respond

to treatment should be considered for multimodal management.

- Current levels of radiological investigation may not be in patients' best interests.
- More uniform evidence informed descriptors of shoulder pain are needed.

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