

Shoulder disorders in the elderly (a hospital study)

M D CHARD AND B L HAZLEMAN

From the Rheumatology Research Unit, Addenbrooke's Hospital, Cambridge

SUMMARY One hundred acute geriatric inpatients were assessed to investigate the prevalence of shoulder disorders; 21 had symptoms due to shoulder disease. Conditions included supraspinatus tendinitis (five), chronic rotator cuff rupture (seven), frozen shoulder (two), glenohumeral osteoarthritis (two), apatite related shoulder arthritis (one), stroke related shoulder disease (six). (Some patients had more than one shoulder condition.) The last group included painful stiff shoulders (three), glenohumeral subluxation (two), and acute shoulder-hand syndrome (one). Patients with rotator cuff rupture had bilateral disease. Only three patients had sought medical attention for their symptoms. The common occurrence of these conditions has possible implications for rehabilitation, and medical awareness is required as few may volunteer symptoms. A community based study is needed to assess the prevalence in the elderly population.

Key words: rotator cuff.

Symptomatic shoulder disorders not related to inflammatory arthritis or trauma appear to have a peak incidence between the ages of 50 and 60.¹⁻⁴ Pathological studies, however, have shown that progressive degeneration commonly occurs in the supraspinatus tendon of the rotator cuff after the age of 30 and continues with increasing age.⁵⁻⁸ In addition, rupture of the tendon is prevalent in the elderly, occurring in 20% or more of cadaveric shoulders.⁹⁻¹¹ It is therefore surprising that shoulder pain is not described more frequently in the elderly.

The discrepancy could be explained if there were no true relationship between clinical symptoms and pathological changes, as suggested by at least one study.¹² Stress on a shoulder is an important factor in the onset of symptoms as manual workers are reported as having an increased tendency to soft tissue shoulder disease.^{2-4,6} The active middle aged person, therefore, with some degeneration might be more prone to symptomatic disease than the less active elderly person with more degeneration. Alternatively, it could be that the apparently low prevalence in the elderly is found because this age group does not seek medical attention or at least is not referred for hospital consultation. Most studies on the shoulder refer to hospital experience. This study sets out to record the incidence of shoulder

complaints in a group of elderly people over the age of 70 admitted to an acute geriatric ward.

Patients and methods

One hundred patients, 50 male and 50 female, over the age of 70 were interviewed and examined on an acute geriatric medical unit. They were in the convalescent phase after an emergency admission or undergoing investigation. No patients had been admitted with a shoulder complaint.

Patients with rheumatoid arthritis or other inflammatory arthropathy were excluded, as were patients with referred shoulder pain. Selection was otherwise made only on the ability to cooperate mentally and physically with the interview and examination. The severity of pain at night, on movement, and at rest was graded as none, mild, moderate, or severe. Disability and previous treatment were recorded. Any relevant or associated medical history was documented as was a past history of shoulder pain, previous occupation, and the use of a walking aid.

Examination of the shoulder included recording the wasting, weakness, deformity and tenderness, the presence of a painful arc, and pain on resisted movements of abduction, external rotation, and internal rotation. The range of both active and passive movements of the shoulders was measured with a pendulum goniometer.¹³ *x* Rays of the shoulder were examined and blood tests taken as

Accepted for publication 14 April 1987.

Correspondence to Dr M D Chard, Rheumatology Research Unit, Level E6, Addenbrooke's Hospital, Hills Road, Cambridge CB2 2QQ.

shoulder conditions have been reported to be more common in diabetes and thyroid disease.

The diagnosis of rotator cuff tendinitis was based on the criteria of Cyriax,¹⁴ i.e., shoulder pain exacerbated by movement against resistance in one or more of the following: abduction (supraspinatus tendinitis); external rotation (infraspinatus tendinitis); internal rotation (subscapularis tendinitis). Although the active range of shoulder movement was normally limited by the pain, the passive range remained approximately normal.

A diagnosis of a frozen shoulder was made when there was a marked restriction of all active and passive movements with external rotation reduced by at least 50% of normal and in the absence of glenohumeral arthritis.

A diagnosis of rotator cuff rupture was made when there was marked hunching on shoulder movements with muscle wasting and difficulty initiating abduction plus weakness and limitation of movement.

Other diagnoses were based on the clinical and x ray findings.

Results

Twenty one out of 100 patients interviewed suffered with true shoulder pain. Thirteen of the female group were affected (26%) compared with eight of the men (16%). The age range of affected individuals (74–90 years, mean 81) was similar for both the sexes. Seven of the 21 patients had been using a walking aid at the time of admission and one was in a self propelled wheelchair. In 11 cases admissions were for acute, new conditions, while in the remainder previous illness was at least a contributing factor in the requirement for admission. None had been admitted for breakdowns in welfare or family arrangements.

Six different symptomatic shoulder lesions were identified (Table 1). There was a preponderance of women with rotator cuff tendinitis (4:1). The length of history was greatest in the presence of rotator cuff rupture or arthritis (Table 2).

Table 1 *Clinical conditions producing symptoms*

Condition affecting shoulder	No of cases
Rotator cuff tendinitis	5
Chronic rotator cuff rupture	7
Primary frozen shoulder	2*
Stroke related shoulder problems	6
Glenohumeral osteoarthritis	2*
Apatite related shoulder arthritis	1

*Indicates patients with more than one shoulder condition.

Table 2 *Length of history*

Condition	Disease duration
Tendinitis	
Unilateral	3–12 months (mean 7.5)
Bilateral	4 years
Rotator cuff rupture	1–14 years (mean 4)
Stroke related	
Frozen shoulder	9 months to 7 years
Shoulder-hand syndrome	2 months
Subluxation	1 and 3 months
Glenohumeral osteoarthritis	4 and 10+ years
Apatite related shoulder disease	10+ years

The level of pain experienced on shoulder movement was mild in seven patients, moderate in 11, and severe in three, though for five in the moderate category the pain was on passive movement of a paretic limb. Pain at night was also a problem in nine patients, but pain at rest was only significant in five. Twenty of the patients felt their condition produced some disability. For 16 of them dressing was painful and difficult. This did include seven patients with shoulder problems related to a cerebrovascular accident, for whom passive movement was painful and added to the disability of their hemiparesis. Washing was difficult for four patients, and three also had difficulty in dressing as well. In addition, three found simple household chores difficult and two complained of difficulty in heavy lifting. Six out of seven with chronic rotator cuff rupture complained of problems in attempting tasks above shoulder height.

Three patients had hypothyroidism on adequate replacement therapy (two with rotator cuff tendinitis and one with a cuff rupture); and one of them was also a non-insulin dependent diabetic. Two other patients (both with a cuff rupture) were also diabetics.

In addition to the 21 patients with symptomatic shoulder disease, a further nine had a past history of shoulder pain but had no current problem. There were also 10 patients who had previously suffered a cerebrovascular accident but had no shoulder symptoms.

ROTATOR CUFF TENDINITIS

This was unilateral in four and bilateral and chronic in one patient: an amputee using a self propelled wheelchair. There was no other precipitating event, and all were of gradual onset with the dominant arm affected in three of the four unilateral cases. The patient with involvement of the non-dominant arm had been protecting a shoulder-hand syndrome of the other arm of two years duration. Only one patient had sought medical attention and was told it

was 'old age'. Radiological changes consisted of mild sclerosis of the greater tuberosity.

All suffered from mild to moderate pain on shoulder movement, and three had night pain aggravated by lying on the affected side. Shoulder abduction produced pain, and three had a painful arc. All had pain on resisted abduction indicative of a supraspinatus lesion.

CHRONIC ROTATOR CUFF RUPTURE

Four men and three women had bilateral lesions of insidious onset, and the dominant arm was most affected. Four had a past history of shoulder pain, but this had resolved some 10 years previously. One patient had been a manual worker and one woman had looked after an invalid husband for many years.

Although there was only mild or no pain at rest, there was pain on movement, mainly towards the extremes of range; active range varied from 50° to 90°. Stiffness and restriction of movement, particularly elevation, was the main complaint.

x Rays showed that a reduction in the subacromial space was present in all, and degenerative changes ranged from minor sclerosis of the greater tuberosity to osteophyte formation. Degenerative changes were also present in the acromioclavicular joint in those with pronounced arthritis.

PRIMARY FROZEN SHOULDER

One man, aged 88, had an acute frozen shoulder with passive abduction limited to 70° and external rotation <50% of the normal side. There was no obvious precipitating event or associated condition.

STROKE RELATED SHOULDER PROBLEMS

These were divided into 3 groups: frozen shoulder, shoulder-hand syndrome, and subluxation.

Frozen shoulder

Three women had developed a painful stiff shoulder affecting the hemiplegic arm. This had persisted in association with marked spasticity in the limb. All were chronic and pain was mainly positional.

Shoulder-hand syndrome

One man aged 77 seen two months after his stroke had features of an acute shoulder-hand syndrome affecting the hemiplegic upper limb.

Subluxation

Two patients seen within three months of their stroke had pain due to downward subluxation of the humeral head associated with poor muscle tone. There was some night as well as positional pain. One also had pain and limitation of movement in the

other shoulder of 10 years' duration and radiological evidence of glenohumeral osteoarthritis.

GLENOHUMERAL OSTEOARTHRITIS

Two patients had glenohumeral arthritis. In one patient it followed a fracture of the surgical neck of the humerus, and in the other patient had followed a stroke.

APATITE RELATED SHOULDER ARTHRITIS

An 89 year old woman with longstanding shoulder pain predominantly affecting the dominant arm had clinical and radiological features of this condition.¹⁵ There was painful restriction of active and passive movements, marked crepitus, and bilateral effusions. No birefringent crystals were seen in the synovial fluid, which contained a low white blood cell count of $0.9 \times 10^9/l$ (98% mononuclear cells).

x Rays showed narrowing of the subacromial space and distortion of the glenohumeral head with osteoarthritis. Calcification was present in the periarticular tissues, and there was also clinical evidence of osteoarthritis of one elbow and one knee.

Discussion

Symptomatic shoulder disorders were common in this hospital survey, occurring in one in five of this elderly group. It is of interest that only three of the 21 patients had sought medical attention. Of these, two had received an anti-inflammatory drug without benefit and one had been advised that the symptoms were due to age. Multiple pathology and a higher acceptance of illness and disability are features of the elderly population. Therefore it is perhaps not surprising that shoulder problems were not reported in this survey.

It is reported that 70% of stroke patients experience shoulder pain and 25% develop a frozen shoulder.^{16 17} The course is often prolonged and treatment difficult owing to limb spasticity, but awareness of the problem and early treatment might be expected to alleviate symptoms and aid rehabilitation. Simple pendulum exercises can help reduce symptoms in chronic rotator cuff rupture. Treatment for patients with an acute frozen shoulder or rotator cuff tendinitis is often beneficial.

The perceived disability of a medical condition depends upon a person's expectations and general level of activity. Difficulty with common tasks such as washing and dressing were frequent complaints, however, and limited self care. In addition, rehabilitation after systemic illness was impaired by poor arm function. An awareness that symptomatic shoulder disorders are common in the elderly is

important, particularly as patients may not volunteer their symptoms, as treatment may be expected to reduce pain and also disability and thus help successful rehabilitation.

Inferences about the significance of the findings of this hospital survey for the elderly in general must be guarded. Although acute rather than chronic care patients were seen, they might be expected to have more ill health and general disability than the elderly in the community. Nearly half the patients with shoulder pain had been admitted with a problem at least partly related to a pre-existing condition. A third of them also used a walking aid, which could have been an aggravating factor, and one in a self propelled wheelchair had a shoulder condition directly related to its use. As only a few patients had admitted to shoulder problems and had sought help, however, it is likely that they may be more common in the elderly than is realised. The prevalence of shoulder disorders in the elderly is unknown, and the findings of this hospital survey have prompted us to set up a study to assess this within the community.

The authors wish to acknowledge the assistance of Dr Campbell, Dr Coni, Dr Davison, Dr Pearson, Dr Webster, Consultants in Geriatric Medicine, Addenbrooke's Hospital, in allowing assessment of patients under their care and Mrs J McAusland for expert secretarial help.

References

- 1 Hazleman B L. The painful stiff shoulder. *Rheumatol Phys Med* 1972; **11**: 413-21.
- 2 Wright V, Haq A M M M. Periarthritis of the shoulder. 1. Aetiological considerations with particular reference to personality factors. *Ann Rheum Dis* 1976; **35**: 213-9.
- 3 Kessel L, Watson M. The painful arc syndrome. Clinical classification as a guide to management. *J Bone Joint Surg [Br]* 1977; **59**: 166-72.
- 4 Bateman J E. *The shoulder and neck*. Philadelphia: Saunders, 1972.
- 5 Skinner H A. Anatomical considerations relative to rupture of the supraspinatus tendon. *J Bone Joint Surg [Am]* 1937; **19**: 137-51.
- 6 Lindblom K. On the pathogenesis of rupture of the tendon aponurosis of the shoulder joint. *Acta Radiologica* 1937; **20**: 563-77.
- 7 Wilson C L, Duff G L. Pathological study of degeneration and rupture of the supraspinatus tendon. *Arch Surg* 1943; **47**: 121-35.
- 8 Simmonds F A. Shoulder pain with particular reference to the frozen shoulder. *J Bone Joint Surg [Br]* 1949; **31**: 426-32.
- 9 Codman E A, Akerson I B. The pathology associated with rupture of the supraspinatus tendon. *Ann Surg* 1931; **93**: 348-59.
- 10 Fowler E B. Stiff painful shoulders exclusive of tuberculosis and other infections. *JAMA* 1933; **101**: 2106-8.
- 11 Keyes E L. Anatomical observations on senile changes in the shoulder. *J Bone Joint Surg [Am]* 1935; **17**: 953-60.
- 12 Olsson O. Degenerative changes in the shoulder joint and their connection with shoulder pain. *Acta Chir Scand (Suppl)* 1953; 181.
- 13 Binder A I, Parr G, Hazleman B, Fitton-Jackson S. Pulsed electromagnetic field therapy of persistent rotator cuff tendinitis: A double-blind controlled assessment. *Lancet* 1984; **i**: 695-8.
- 14 Cyriax J. Diagnosis of soft tissue lesions. In: *Textbook of orthopaedic medicine*. London: Ballière Tindall, 1971.
- 15 McCarty D J, Halverson P B, Carrera G F, Brewer B J, Kozin F. 'Milwaukee shoulder'—association of microspheroids containing hydroxyapatite crystals, active collagenase, and neutral proteases with rotator cuff defects. 1. Clinical aspects. *Arthritis Rheum* 1981; **24**: 464-73.
- 16 Caldwell C B, Wilson D J, Brain R M. Evaluation and treatment of the upper extremity in the hemiplegic stroke patient. *Clin Orthop* 1969; **63**: 69-93.
- 17 Jayson M I V. Frozen shoulder and adhesive capsulitis. *Br Med J* 1981; **283**: 1005-6.