

# Annals of the Rheumatic Diseases

## Leader

### Work related upper limb disorders: getting down to specifics

Musculoskeletal disorders of the upper limb and neck are a common cause of morbidity, and in some occupational groups they contribute importantly to loss of time from work.<sup>1-5</sup> Community-based surveys have indicated point prevalences of 4-20% for pain at specific sites in the neck and upper limb,<sup>6-9</sup> with lifetime prevalences as high as 60%. Morbidity surveys in primary care have found an annual incidence of first consultation for upper limb disorders of approximately 25 per 1000 person years, with rates increasing from 25 to 45 years of age and then levelling off.<sup>10</sup>

Upper limb pain may arise from discrete pathological conditions, such as adhesive capsulitis, rotator cuff tendinitis, lateral epicondylitis, and tenosynovitis, or as part of non-specific regional pain syndromes. However, few community surveys have included a clinical examination as an integral component, to enable a distinction to be drawn between these very different categories of disorder. Furthermore, the relative contribution of specific and non-specific rheumatic disorders of upper limb and neck to handicap from occupational and leisure activities is not clear (despite the fact that the risk factors may vary substantially between the two groups).

As table 1 illustrates, investigations have differed in their choice of age range, source population, prevalence period, and case definition, and as a consequence their findings cannot be compared directly. No clear sense can be gained of the degree of overlap between the various disorders, and this unpromising backdrop hinders the rigorous investigation of putative risk factors, such as occupational mechanical stressors and psyche.

One important sticking point has been the lack of a widely agreed approach to the classification of neck and upper limb disorders in epidemiological studies, but in this area there has been important progress recently. A workshop of experts was convened in Birmingham in February 1997 to identify suitable case definitions for use in epidemiological research on work related upper limb pain complaints, and Harrington *et al*<sup>11</sup> have now reported on the deliberations of the proceedings.

The conference, which was organised by the Health and Safety Executive and the University of Birmingham, used the so called "Delphi" technique to establish a consensus set of diagnostic criteria for several of the more common disorders of the upper limb. The Delphi method is a group process aimed at capturing and distilling professional judgement.<sup>12</sup> It entails collating, analysing, and re-discussing information about a topic in a structured manner within a group of experts. In the case of the Birmingham workshop, a broadly constituted group of 29 experts were assembled from the fields of rheumatology, orthopaedic surgery, occupational medicine, epidemiology, physiotherapy, ergonomics, clinical psychology, and general practice, and together agreed diagnostic criteria for eight specific disorders of the upper limb and one non-specific disorder. The conditions covered by the criteria are: rotator cuff tendinitis, bicipital tendinitis, shoulder capsulitis, lateral epicondylitis, medial epicondylitis, de Quervain's disease of the wrist, tenosynovitis of wrist, carpal tunnel syndrome, and (as a diagnosis of exclusion) non-specific diffuse forearm pain (table 2). In all categories except carpal tunnel syndrome the criteria are wholly clinical,

Table 1 Prevalence studies of regional pain and clinical disorders in the upper limb and neck

Pain site/disorder	Age group	Prevalence interval	Prevalence	Study population	Source
Shoulder pain	31-74	point	20%	community, Stockholm	Allander <i>et al</i> <sup>6</sup>
	working age	point	13%	aeroengineering factory	Dimberg <i>et al</i> <sup>13</sup>
	middle age	one month	14%	community, Malmo	Bergenudd <i>et al</i> <sup>7</sup>
Elbow pain	33-39	point	11.6%	textile workers	McCormack <i>et al</i> <sup>8</sup>
	working age	point	11-13%	aeroengineering factory	Dimberg <i>et al</i> <sup>13</sup>
Epicondylitis	working age	point	2%	aeroengineering factory	Dimberg <i>et al</i> <sup>13</sup>
	31-74	point	2.5%	community, Stockholm	Allander <i>et al</i> <sup>6</sup>
Epicondylitis and tenosynovitis	50-70	point	4.7%	community, Sweden	Jacobsson <i>et al</i> <sup>9</sup>
	33-39	point	3.5%	textile workers	McCormack <i>et al</i> <sup>8</sup>
Carpal tunnel syndrome	25-74	point	0.6% (M)	community, Holland	de Krom <i>et al</i> <sup>14</sup>
			8% (F)		
Neck pain	25-74	point	10%	community, US	Cunningham <i>et al</i> <sup>15</sup>
	33-39	point	4%	textile workers	McCormack <i>et al</i> <sup>8</sup>
	working age	point	10%	aeroengineering factory	Dimberg <i>et al</i> <sup>13</sup>

Table 2 Diagnostic criteria for upper limb disorders: report of a Delphi consensus workshop (HSE and Institute of Occupational Health, University of Birmingham 1997)<sup>11</sup>

Condition	Diagnostic criteria
Rotator cuff tendinitis	History of pain in the deltoid region <i>and</i> pain on resisted active movement (abduction - supraspinatus; external rotation - infraspinatus; internal rotation - subscapularis)
Bicipital tendinitis	History of anterior shoulder pain <i>and</i> pain on resisted active flexion or supination of forearm
Shoulder capsulitis (frozen shoulder)	History of pain in the deltoid area <i>and</i> equal restriction of active and passive glenohumeral movement with capsular pattern (external rotation > abduction > internal rotation)
Lateral epicondylitis	Epicondylar pain <i>and</i> epicondylar tenderness <i>and</i> pain on resisted extension of the wrist
Medial epicondylitis	Epicondylar pain <i>and</i> epicondylar tenderness <i>and</i> pain on resisted flexion of the wrist
De Quervain's disease of the wrist	Pain over the radial styloid <i>and</i> tender swelling of first extensor compartment <i>and</i> either pain reproduced by resisted thumb extension or positive Finkelstein's test
Tenosynovitis of wrist	Pain on movement localised to the tendon sheaths in the wrist <i>and</i> reproduction of pain by resisted active movement
Carpal tunnel syndrome	Pain or paraesthesia or sensory loss in the median nerve distribution <i>and</i> one of: Tinel's test positive, Phalen's test positive, nocturnal exacerbation of symptoms, motor loss with wasting of abductor pollicis brevis, abnormal nerve conduction time
Non-specific diffuse forearm pain	Pain in the forearm in the absence of a specific diagnosis or pathology (sometimes includes: loss of function, weakness, cramp, muscle tenderness, allodynia, slowing of fine movements)

comprising a history component together with one or more physical signs.

As one of the goals was to provide an instrument for testing hypotheses of work relation, deliberate care was taken to omit any mention of "work relatedness of symptoms" from the criteria.

The agreed definitions cover many important rheumatic complaints, but exclude several others that are also of concern to rheumatologists and occupational physicians. In particular, no criteria were proposed for disorders of the neck that lead to symptoms in the arms, or for conditions such as acromioclavicular joint dysfunction, subacromial bursitis or olecranon bursitis. Thoracic outlet syndrome, which is commonly diagnosed and attributed to occupational activities in some countries, was considered sufficiently rare in UK experience not to require inclusion.

Harrington and his colleagues draw attention to a number of limitations of the process and its outcome. It was accepted that a relatively small number of opinions had been sampled—too few to represent the conclusions as national opinion. It was noted that no clear definition had been developed to define the extent, distribution, evolution or duration of disease; and no clear thought had so far been given to optimising the sequence of assessment to establish a "best fit" diagnosis based on the criteria. Finally, it was emphasised that the validity and repeatability of the criteria were wholly untested; and, more taxing still, that in most cases no characteristic (gold standard) pathological or physiological changes existed that could be used to determine validity by corroborating clinical opinion.

The Birmingham criteria provide a good starting point for epidemiological investigation of neck and upper limb complaints, and will, no doubt, prove useful in the community-based and industry-based surveys. However, like many good consensus statements, they fall short of delivering the valid, repeatable, workable protocol that researchers crave. Their limitations can readily be demonstrated by reference to the definitions supplied for disorders of the shoulder in table 2. A clinical researcher might reasonably ask how often two observers will agree about where the boundaries of the shoulder, deltoid region or anterior shoulder are located; or where a subject should feel his pain during an examination of resisted shoulder movement; or what degree of restriction of movement can be regarded as significant and how this should be determined. The Birmingham criteria offer a skeleton

framework for diagnosis, but as the authors emphasise, they are not an end in themselves.

These problems are not insoluble, but extra development work is now needed to put flesh on the bones. Harrington and his colleagues envisage further refinements as the findings of well designed studies become available, and even the production of a video or manual of test techniques, ensuring a common basis of assessment in national and international practice. Certainly a valid, repeatable diagnostic schedule for the neck and upper limb area would represent an important advance in musculoskeletal research, and one that should enable light to be shed on an area of relative obscurity.

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