

Periarthritis of the shoulder

I. Aetiological considerations with particular reference to personality factors

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Wright, V., and Haq, A. M. M. M. (1976). *Annals of the Rheumatic Diseases*, 35, 213–219. **Periarthritis of the shoulder. I. Aetiological considerations with particular reference to personality factors.** 186 patients with periarthritis of the shoulder have been studied. The sex ratio was female:male, 1.52:1. The peak age of onset was 54–59 years in both sexes. Over 40% of the patients were referred to the clinic after 6 months had elapsed from the time of onset of the disease. The right shoulder was more frequently involved than the left, particularly in the men. One shoulder only was affected in 75% of patients. There was frequently a previous history of 'rheumatism' before the episode of periarthritis. In one-third of the women 'nonspecific rheumatism' had occurred. Cervico-brachial pain and a previous episode of shoulder pain had occurred more often in the women.

There were a number of associated diseases, ischaemic heart disease, thyroid disease among women, diabetes among women, hemiplegia, pulmonary tuberculosis, chronic bronchitis, and epilepsy. Acute trauma was rarely a precipitating factor. Manual workers were more frequently seen than sedentary workers in the sample, and there were more in the sample than in the general population of Leeds.

The general psychological background was no different from a control group. The Maudsley Personality Inventory gave no different results among patients with periarthritis of the shoulder than among a control group and among the general population. It is suggested that there is no evidence in this study for a 'periarthritic personality'.

It is suggested that the cause of periarthritis of the shoulder is likely to be related to chronic trauma occurring in an age range when changes in connective tissue are occurring. Certain associated diseases may predispose the patient to this disorder.

Periarthritis of the shoulder is a common disorder. Contributions of Duplay at the close of the 19th century represent the first efforts to distinguish it from the vague, general classification 'arthritis' (Duplay, 1896, 1900). The most complete clinical description of the condition was that of Codman (1934), but the pathological basis of the ailment was obscure to him. In his large book on the shoulder, only 8 pages were devoted to the condition, and he wrote, 'these are common cases, but it does not take a long chapter for me to tell all I know about them'.

The syndrome is important because of its frequent occurrence, its limiting effect on work capacity, its

frequent resistance to treatment, and its progression at times to a capsulitis resulting in prolonged severe disability before resolution occurs. The unique feature is that the same pathology does not appear to affect joints other than the shoulder, and a 'frozen shoulder' may present as a virtually complete ankylosis and then spontaneously 'thaw', leaving a relatively normal joint. This may occur as an isolated incident in the life of a patient who appears perfectly healthy and continues to remain so. Although the condition is called 'periarthritis', there is little evidence of active inflammation. This diagnostic category has received little scientific attention, and though suggestions

about aetiology abound, there have been few controlled studies of any aspect. Table I lists many of the suggested causative factors.

A 'periarthritic personality' has been suggested (Coventry, 1953; Craig and Witt, 1955). Some have implicated psychological factors (Carrière and Kérambrum, 1967; Lorentz and Musser, 1952; Amick, Gilmer, and Sutton, 1966; Evans, 1946; Homans, 1940), but others feel that personality characteristics develop as a result of the disease rather than being its cause (Quigley, 1956; Haggart, Dignam, and Sullivan, 1956). Some authors state categorically that psychological factors play no part in the causation of periarthritis of the shoulder (de Takats, 1945; Johnson, 1959; Graham and Rosen, 1962). The present study has tried to resolve these conflicting views.

Table I *Factors in the aetiology of periarthritis of the shoulder from the literature*

<i>Aetiological factors</i>	<i>Authors</i>
Trauma	Withers (1949) De Palma (1952) Coventry (1953) Crisp and Kendall (1955) Mogensen (1956) Charnley (1959) Steinbrocker (1966) Mattingly (1968)
Ischaemic heart disease	Howard (1930) Libman (1935) Leech (1938) Boas and Levy (1938) Ernstene and Kinell (1940) Askey (1941) Johnson (1943) Laine (1953) Quigley (1956) Minter (1967)
Chronic bronchitis	Saha (1966)
Pulmonary tuberculosis	Franklin and Nemcik (1954) Einaudi (1956) Johnson (1959) Vidal and others (1966) Carrière and Kérambrum (1967)
Isoniazide	Johnson (1969) Dubre and others (1965) Carrière and Kérambrum (1967)
Thyroid disease	Duncan (1928) Iversen, Sindbjerg-Hansen, and Snorrason (1946) Meulengracht and Schwartz (1951) Oldham (1959) Coste and others (1967)

Table I—continued

<i>Aetiological factors</i>	<i>Authors</i>
Barbiturates (shoulder-hand syndrome)	Van der Korst and Cats (1967) Arlet and others (1967) Desai and Dastur (1967)
Cervical disc degeneration	Oppenheimer (1938) Laine (1953) Kamieth (1965) Silberstein (1965)
Personality	Lorentz and Musser (1952) Coventry (1953) Mogensen (1956) Oesterreicher and Van Dam (1964) Carrière and Kérambrum (1967)
Immobility	Ghormley (1947) De Palma (1952) Franklin and Nemcik (1954) Quigley (1956) Mogensen (1956) Thompson (1962)
Reflex sympathetic dystrophy	Askey (1941) Steinbrocker, Spitzer, and Friedman (1948) Mogensen (1953) Rosen and Graham (1957)

Materials and methods

186 patients with periarthritis of the shoulder were examined. Diagnostic criteria were that (1) the shoulder pain should be of more than 3 weeks' duration; (2) there should be limitation of shoulder joint movement both actively and passively; and (3) there should be no other known cause of arthritis, neurological disorder, or bone disease, by clinical, haematological, and radiological examinations. All patients had a complete clinical examination. Specific inquiries were made regarding psychological aspects, previous psychiatric disease, and the need for previous psychiatric treatment either as an inpatient or outpatient, and whether they had any worries, sleep disturbance, or habit of nail biting.

The patients were given a Maudsley Personality Inventory, which is designed to give a quick, rough measure of two important personality dimensions, neuroticism or emotionality, and extroversion. Each of these two traits was measured by means of 24 questions carefully selected after lengthy item analysis and factor analysis. A group control sample was selected from patients coming for refraction to the Eye Outpatient Department of the General Infirmary at Leeds, none of whom had severe eye disease or other physical ailments. Other control data are available in the literature for the Maudsley Personality Inventory.

Results

Of the 186 patients, 113 were women, a sex ratio of about 3:2, female:male. The age of the male patients ranged from 25 to 84 years, the women from 20 to 84

years; the majority being between 50 and 70 years (Table II). The age of onset is shown in the Figure, the peak age being between 54 and 59 years in both sexes. One-third of the men and one-quarter of the women were referred within 3 months, but 43% of the men and 47% of the women were referred after 6 months had elapsed from the time of onset of the disease (Table III). The disease occurred more commonly between the months of October and April than between the months of May and September. Clinically the pain was usually insidious in onset and moderately severe. It often radiated down the outer aspect of the arm to the elbow, occasionally to the hands and fingers, and sometimes to the cervical region.

The majority of patients (79% of the men and 73% of the women) had unilateral involvement. The right

Table III Duration of disease before referral to a consultant

Duration (m)	Males (72)	Females (111)
1-3	24	27
4-6	17	24
7-9	12	23
10-12	9	16
13-18	1	6
19-24	3	3
25-36	3	5
37+	3	7

shoulder was affected in 61.4% of the men and 50.3% of the women. The left shoulder was affected in 38.5% of the men and 49.2% of the women.

Table II Age of the patients

Age of patients (years)	Periarthritis		
	Male	Female	Total
20-29	2	6	8
30-39	5	9	14
40-49	14	14	28
50-59	24	35	59
60-69	21	31	52
70-79	6	15	21
80-89	1	3	4
Total no.	73	113	186

ASSOCIATED DISEASES

Ischaemic heart disease, hypertension, and chronic bronchitis were the commonest associated diseases (Table IV).

TRAUMA

Only 2 men and 4 women gave a history of trauma to the shoulder before the onset of pain.

OCCUPATION

The majority of the men were manual workers and there were more manual workers in this group than the proportion in Leeds shown in the last published census—this comparison is shown in Table V.

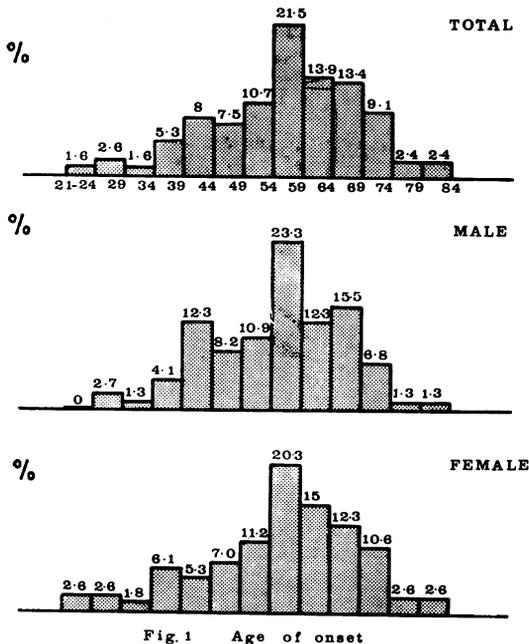


FIGURE Age of onset of periarthritis of the shoulder

Table IV Prevalence of associated disease in both sexes

Associated disease	Male (73)	Female (113)
Ischaemic heart disease	10 (13.6)	16 (14.1)
Thyroid disease	—	11 (9)
Diabetes mellitus	1 (1.4)	5 (4.4)
Hemiplegia (old)	3 (4.1)	1 (0.9)
Pulmonary tuberculosis	2 (2.7)	1 (0.9)
Chronic bronchitis	10 (13.6)	8 (7)
Epilepsy	1 (1.4)	2 (1.7)
Hypertension	6 (8.2)	13 (11.5)

Percentage in parentheses.

Table V Periarthritis of the shoulder in men. Occupations compared with population

Occupation	Periarthritis (%)	Census figures (%)
Manual	67.3	24.6
Sedentary	13.5	60.2
Supervisory	11.5	9.7
Executive	1.9	3.7
Other	5.7	1.8

DRUGS

Barbiturates were taken by 15% of the men and 33% of the women. Phenytoin was taken by one man and 2 women suffering from epilepsy. Isonicotinic acid hydrazide was taken by only one man being treated for an old pulmonary tuberculosis.

PREVIOUS RHEUMATIC HISTORY

The majority of patients did not complain of any previous rheumatic ailments. About one-third of the women, however, complained of nonspecific rheumatism. Some complained of past shoulder pain and cervicobrachial neuralgia, especially the women (Table VI).

Table VI *Previous rheumatic disease in both sexes*

<i>Previous rheumatic disease</i>	<i>Male (72)</i>	<i>Female (108)</i>
Shoulder pain	7 (9.6%)	22 (19.5%)
Cervicobrachial pain	3 (4.1%)	12 (10.6%)
Nonspecific rheumatism	13 (17.8%)	40 (35.9%)

Table VII *Psychological background of patients with peri-arthritis of the shoulder and of a control group*

<i>Psychiatric features</i>	<i>Periarthritis</i>		<i>Controls</i>	
	<i>Male (72)</i>	<i>Female (108)</i>	<i>Male (26)</i>	<i>Female (43)</i>
Worries	34 (48)	69 (64)	9 (34.6)	21 (48.8)
Insomnia				
before	13 (18)	38 (35.2)	2 (7.6)	11 (25.6)
after	19 (26.4)	37 (34.2)		
Night sedation	9 (15)	31 (33)	1 (3.8)	9 (20.9)
Nail biting	1 (1.4)	3 (2.7)	—	—
Previous psychiatric illness	2 (2.7)	4 (3.7)	—	—

Percentage in parentheses.

Table VIII *MPI for neuroticism in peri-arthritis (PA) and control groups (Con) compared with a large group from the literature*

<i>Scores</i>	<i>Male</i>		<i>Female</i>	
	<i>PA (60)</i>	<i>Con (26)</i>	<i>PA (88)</i>	<i>Con (43)</i>
0-10	13 (21.7)	8 (30.8)	8 (9)	4 (9.9)
11-20	19 (31.7)	10 (38.5)	27 (30.7)	18 (41.8)
21-30	17 (28.3)	3 (11.6)	22 (25.0)	11 (25.6)
31-40	10 (16.7)	5 (19.2)	27 (30.7)	5 (11.6)
41-50	1 (1.7)	0	4 (4.5)	5 (11.6)
Mean	19.5	16.9	24.09	22.4
SD	±10.64	±11.02	±10.79	±11.57
Normal (1800)		19.89 (SD ± 11.02)		
t-test	No significant differences			

Percentages in parentheses. MPI = Maudsley Personality Inventory.

PSYCHOLOGICAL FACTORS

Table VII shows the psychological background of the patients and the control group. Nearly half the men and two-thirds of the women admitted to being worriers and approximately one-fifth of the men and one-third of the women suffered from insomnia before the onset of the disease. 6 patients with a history of psychiatric illness had required treatment in hospital. More patients among the peri-arthritis group volunteered that they were worriers, had insomnia, and took night sedation than in the control group, but these differences were not statistically significant. The nearest approach to significance concerned worry in female patients ($\chi^2 = 2.8565$; $P = 0.10 > 0.05$).

MAUDSLEY PERSONALITY INVENTORY

Completed questionnaires were available from 60 males and 88 female patients suffering from peri-arthritis of the shoulder and from 26 male and 43 female controls. Their scores for neuroticism and extroversion are shown in Tables VII and VIII. There were no significant differences between any of the scores in patients with peri-arthritis of the shoulder

Table IX *MPI for extroversion in patients (PA) and controls (Con)*

Scores	Male		Female	
	PA (60)	Con (26)	PA (88)	Con (43)
0-10	2 (3.3)	4 (15.4)	8 (9.0)	2 (4.6)
11-20	10 (16.7)	6 (23.1)	27 (30.7)	13 (30.2)
21-30	23 (38.3)	2 (7.6)	22 (25)	14 (32.5)
31-40	19 (31.7)	11 (42.3)	27 (30.7)	13 (30.2)
41-50	6 (10.0)	3 (11.5)	4 (4.5)	1 (2.3)
Mean	27.8	26.2	24.1	24.5
SD	±9.76	±13.36	±10.79	±9.50
Normal (1800)		24.91 SD ± 9.71		
t-test	No significant differences			

Percentages in parentheses.

compared with the distribution with the control group, nor compared with a normal population survey.

Discussion

It is appreciated that any hospital population is a selected sample, and this is clearly shown by the time before referral to a special unit, but it was felt that such delay in referral would, if anything, bias the study toward finding untoward psychological factors in the group. The series is in keeping with those previously reported as far as the sex ratio is concerned—women:men, 3:2 (Duncan, 1928; DePalma, 1952; Laine, 1953, Mogensen, 1956; Lloyd-Roberts and French, 1959; Kamieth, 1965), and the mean age of onset of 56 years was fully in keeping with published reports (Johnson, 1959; Graham and Rosen, 1962). The greater frequency of occurrence in the right shoulder rather than the left has also been noted previously (Mogensen, 1956; Milone and Copeland, 1961; Baird, 1941; Young, 1946; Kratzman and Frankel, 1952; Friedman, 1957).

In the present series acute trauma was surprisingly infrequent as an alleged precipitating factor. It was noted that the majority of men were manual workers and one could therefore invoke chronic trauma. There were more manual workers in this group than the proportion in Leeds during the same period. A clinic population, however, is likely to have more manual workers than supervisory or executive grades, who may well be seen as private patients. Among the men the right shoulder was especially more often affected than the left, perhaps indicating a factor of

chronic trauma as well. The present series also showed a significant prevalence of other diseases which have been mentioned in the literature, *i.e.* ischaemic heart disease, thyroid disease (among the women), hemiplegia, pulmonary tuberculosis, chronic bronchitis, epilepsy, and hypertension. With regard to diabetes, an association pointed out by Bridgman (1972), there was no significant increase in the prevalence among men but in the women it was three times as common in the periarthritic group as it is in the population (Malins, 1968).

It has been commonplace to speak of a 'periarthritic personality' as being a factor in the aetiology. For this reason specific inquiry was made about simple behavioural aspects and a Maudsley Personality Inventory used to obtain some degree of objectivity for the results. The difficulty of psychological assessments is finding a suitable control group. Eye patients who were undergoing refraction were used. On the basis of these data, together with controlled data cited elsewhere, it was noted that although the group with periarthritis of the shoulder admitted to more worrying and slept less well at night, there was no significant difference in the scores for neuroticism or extroversion on the Maudsley Personality Inventory assessment. The evidence from this study therefore favours the assertion that psychological factors are of little importance in the causation of this condition.

It is most likely that periarthritis of the shoulder is due to an inter-relationship of a number of factors, in which age is prominent. The peak age of onset is at a time when changes in connective tissue are prominent (Wohwinkel, 1931; Verzár, 1957; Ridge

and Wright, 1966). In a careful biomechanical study of the shoulder Reeves (1968) showed that the strength of the capsule and capsular ligament varies with age, becoming weaker from the fifth decade. There may be a precipitating factor to trigger the condition, but this is rarely acute trauma. Repeated trivial injuries such as those sustained by manual workers, or by subjects put to another task may suffice. It may well be that the associated diseases are also associated with alterations in the connective

tissue of the body due to aging, making the subject more liable to such a complication.

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