

Study on Musculoskeletal Complaints Involving the Back, Neck and Upper Limbs

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ABSTRACT

Objective & Methods: A mail questionnaire survey was conducted among designated factory doctors (DFDs) to determine the nature and extent of musculoskeletal aches/pains in patients attending their clinics over one working week. Information was recorded for all patients aged 15 years and above presenting with aches or pains in the back, neck or upper limbs, as the main complaint or as one of the presenting symptoms.

Results: For the 155 doctors participating in the survey, the total attendance of patients aged 15 years and above during the study period was 35,010. Of these, 3.9% presented with the symptoms studied and 1.8% had work-related complaints.

The commonest site affected was the back (55.7%), followed by the neck (21.4%) and shoulders (19.2%). A higher proportion of males than females had back complaints with the reverse for complaints involving hands/wrists and arms/forearms.

82.3% of the affected were employed, 60.3% being production workers, compared to 33.3% professional/office workers and 6.4% service workers. Of the patients who were working, 51.3% had work-related symptoms and 54.4% were given medical leave. Production workers had the highest proportion with work-related symptoms while service workers had the highest proportion given medical leave. The "medical certificate rate" was highest for back symptoms - 57.6%, while work-related symptoms was highest for complaints involving hands/wrists.

Conclusion: The study findings are consistent with those of a 1993 morbidity survey of outpatients in Singapore and indicate that the prevalence of work-related musculoskeletal aches/pains is not high.

Keywords: musculoskeletal complaints, outpatients, designated factory doctors, Singapore

INTRODUCTION

Musculoskeletal disorders, which encompass a range of conditions, including repetitive strain injuries (RSI) or cumulative trauma disorders (or CTDs), and chronic back strain, have been reported to account for a significant amount of sickness absence in a number of the developed countries. Over 302,000 cases of CTDs were reported in 1993 in the USA, an

increase of 63% compared to 1990⁽¹⁾. These cases accounted for nearly two-thirds of all occupational illnesses. Some 26,000 or one-third of all time-loss claims accepted by the British Columbia Workers' Compensation Board in 1993 were for CTDs. These involved about 1.2 million days of lost work time⁽¹⁾. In comparison, such disorders comprised about 1.2% of all occupational disease cases requiring an absence of four days or more reported in Japan in 1994⁽²⁾.

In Singapore, repetitive strain disorders of the upper limbs have been notifiable under the Factories Act since 1 April 1995⁽³⁾. The condition is compensable under the Worker's Compensation Act⁽⁴⁾. Between 1986 and 1996, there were 29 such cases reported to the (former) Ministry of Labour, of which six received workmen's compensation for permanent disability. In addition, nine cases of work-related back complaints were reported to the Ministry, although none had permanent disability requiring workmen's compensation. Such notified cases formed only 0.3% of all occupational disease cases reported during the 11-year period, although these probably represented the more severe cases. There have been no published reports on the prevalence of this condition among the working population in Singapore.

This survey was carried out to determine the nature and extent of musculoskeletal aches and pains among patients seen by designated factory doctors (DFDs). These doctors are registered with the Ministry to conduct statutory medical examinations for workers in certain special risk occupations under the Factories (Medical Examinations) Regulations⁽⁵⁾ and all have training in occupational health. Almost all are private general practitioners.

METHODS

Letters were sent to all full-time practising DFDs, informing them of the objective of the study and requesting them to record basic information on all patients aged 15 years and above who complained of aches or pains in the back, neck or upper limbs, either as the main complaint or as one of the presenting symptoms. To minimise the effects of day-of-the-week variation in cases seen, attendances at the clinics during a one working week period from mid July 1994 was reckoned. The information recorded included the patient's age, sex, ethnic group and occupation, the location of the pain or ache, whether these were work-related, based on the DFDs' opinion, whether

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medical leave was given and any previous history of such symptoms.

The forms were returned using a self-addressed envelope. DFDs who did not respond were contacted by telephone to seek their co-operation to participate in the study within the three months survey period. Those who responded to the second appeal were mainly DFDs who had been away, on leave or had not submitted their returns for one reason or another. DFDs who had retired, stopped working, working in institutions, working part-time, on overseas posting or doing locum work were excluded from the study. Subsequent analysis showed no significant differences in the profile of respondents and non-respondents (in terms of type of practice – group or solo), or time-related trends in the prevalence of cases within the study period.

Demographic data on the total attendances at the DFD clinics during the survey period was not requested as capturing this information would entail considerable additional work on the part of the DFDs. With this constraint in the study design, comparisons were made where data was available, between our patients with musculoskeletal symptoms and those of the general population⁽⁶⁾, as well as patients in the 1993 national morbidity survey⁽⁷⁾. As all the DFDs participating in the survey were from general practice clinics rather than government primary health care clinics, all comparisons with the 1993 national morbidity survey were made for data on patients attending general practice clinics⁽⁷⁾. For data on occupation, comparisons were made with the 1994 Labour Force Survey population⁽⁸⁾.

In analysing the data, differences in proportions were tested using Fisher's exact test and chi-square test, where appropriate.

RESULTS

At the time of the survey, there were 424 full-time practising DFDs. Of these, 155 participated in the survey, giving a response rate of 36.6%, comparable

to the 31% response rate achieved among private general practitioners in the 1993 national morbidity survey⁽⁷⁾.

57.4% of the DFDs participating in the survey were in solo practice and 42.6% in group practice, as against 46.7% and 53.3%, respectively, among all full-time practising DFDs. A separate analysis showed no significant differences in the prevalence of cases between the solo and group practices.

During the survey period, the clinics of the survey participants saw a total attendance of 35,010 involving patients aged 15 years and above. Of these, 1,357 (3.9%) were associated with symptoms of aches or pains in the back, neck or upper limbs.

Sex, ethnic group and age distribution

Table I shows the distribution of patients with musculoskeletal symptoms by sex, ethnic group and age. Compared to the general population⁽⁶⁾ as well as to attendances in the 1993 national morbidity survey⁽⁷⁾, a relatively higher proportion of these patients were male – 58.9% as against 50.0%⁽⁶⁾ and 46.3%⁽⁷⁾, respectively. Using the same comparisons, there was a lower proportion of Chinese: 56.4% as against 78.9%⁽⁶⁾ and 76.5%⁽⁷⁾, respectively and higher proportions of the other ethnic groups, eg, for the Malays: 27.4% as against 13.1% in both the general population and morbidity survey group^(6,7), and for the Indians: 11.8% as against 7.0%⁽⁶⁾ and 6.5%⁽⁷⁾, respectively. No obvious age differences were observed.

Occupation, medical leave, work-relatedness and previous history of symptoms

Compared to the patient profile in the 1993 national morbidity survey⁽⁷⁾, a higher proportion of our patients with musculoskeletal symptoms were working – 82.3% as against 67.7%. Among these patients, there was a higher proportion of production workers (60.3%), as against professionals/office workers (33.3%) and service workers (6.4%) when compared to the 1994 Labour Force Survey population⁽⁸⁾ – 39.4%, 47.2% and 13.4%, respectively.

Of the patients who were working, 51.3% were considered to have work-related symptoms and 54.4% were given medical leave (Table II). This "medical certificate rate" was higher compared to the overall rate of 30.7% reported for working persons attending general practice clinics in the 1993 national morbidity survey⁽⁷⁾.

Production workers formed the highest proportion with work-related symptoms, while service workers formed the highest proportion given medical leave. Professionals and office workers formed the lowest proportions in both instances (both comparisons: $p < 0.005$). Interestingly, 27.9% of housewives were considered to have work-related symptoms.

A separate analysis showed that, among the production workers, a higher proportion of males than females had work-related musculoskeletal symptoms – 65.9% as against 56.6% – and were given medical leave – 61.0% as against 50.6% (both comparisons: $p < 0.005$). No gender differences were noted in

Table I – Sex, ethnic and age distribution of patients with musculoskeletal complaints^a

Ethnic group/ age (years)	Patients with musculoskeletal complaints		
	All	Male	Female
All persons	1,357 (100%)	799 (100%)	558 (100%)
Chinese	56.4%	50.1%	65.4%
Malays	27.4%	32.7%	19.9%
Indians	11.8%	12.6%	10.6%
Others	4.4%	4.6%	4.1%
15 years –	2.7%	2.5%	3.1%
20 years –	20.3%	23.0%	16.5%
30 years –	26.6%	27.5%	25.3%
40 years –	28.2%	27.3%	29.4%
50 years –	14.2%	14.0%	14.5%
60 years	8.0%	5.4%	11.3%

a: All persons aged 15 years & above

Table II – Work-relatedness and medical leave given by occupation^a

Occupation	Patients with symptoms	% work-related	% given medical leave
All persons	1,357 (100%)	45.9%	45.8%
Employed persons^b:	1,117 (100%)	51.3%	54.4%
Production workers	674 (100%)	63.6%	58.5%
Professionals/ office workers	372 (100%)	29.0%	43.8%
Service workers	71 (100%)	50.7%	71.8%
Persons not working:	240 (100%)	20.8%	5.4%
Housewives	140 (100%)	27.9%	0%
Students, retirees	99 (100%)	11.1%	12.1%
Unknown	1 (100%)	0%	0%

a : All persons aged 15 years & above

b : Classification of occupations is based on the Singapore Standard Occupational Classification, 1990⁽⁹⁾ –

- “Production workers” include production craftsmen, plant and machine operators and assemblers, cleaners, labourers and related workers, agricultural and fishery workers.
- “Professionals/office workers” include managers, technicians and associate professionals, and clerical workers
- “Service workers” include service, shop and market sales workers

work-relatedness of symptoms or medical leave given for service workers, professionals and office workers.

Six hundred and seventy-three (49.6%) of the patients with musculoskeletal complaints had a previous history of similar problems. No association was observed between having a past history of such symptoms and employment status or occupation.

Site distribution of symptoms

The commonest site affected was the back, followed by the neck and shoulders (Table III). A higher proportion of males than females had back complaints ($p < 0.005$), while a higher proportion of females than males had complaints involving the hands/wrists and arms/forearms (both $p < 0.005$). No obvious differences in age, ethnic group or occupation were noted in the site distribution of symptoms.

The “medical certificate rate” was highest for back complaints – 57.6% among those who were employed. However, the proportion of patients with work-related symptoms was highest for complaints involving the hands/wrists – 57.0% among all patients, and 65.8% among those who were employed (both: $p < 0.005$). Neck complaints appeared to be the least work-related. Interestingly, while among the males, back complaints accounted for the second highest in terms of work-related symptoms, for the females, such complaints were not as prevalent as symptoms involving the arm/forearm.

DISCUSSION

We have attempted, through this simple questionnaire survey, to determine the nature and extent of musculoskeletal complaints in an outpatient population, namely, patients seen by DFDs. It should be pointed out that, while it provides a convenient population for study, the patient catchment of the DFDs is not complete and the findings, which were

based on a small proportion of patients who presented with such symptoms, may not necessarily be representative of the overall situation. Nevertheless, with the constraints of the study design, we were able to make some useful comparisons of our findings with relevant available data.

Our study shows that 3.9% of the patient attendances were associated with symptoms of aches or pains in the back, neck or upper limbs. This appears consistent with the findings in the 1993 national morbidity survey⁽⁷⁾ that 5.6% of attendances at general practice clinics involved arthritic conditions and rheumatism, which would have included back, neck, shoulder and upper limb complaints, as well as symptoms involving other sites. Due to methodological differences, comparisons with overseas data may be more difficult⁽¹⁰⁾. Inter-country variations in prevalence may be influenced by, among other things, cultural differences in reporting pain and local implementation of legislation^(7,10,11).

Incidence estimates for primary care cases in UK indicate that, in 1980 – 1981, 10% of adults consulted a general practitioner at least once in the course of a year for non-articular musculoskeletal pain, half of them presenting with low back pain⁽¹⁰⁾. More recently, quoting the Office of Population Censuses Surveys, 1993, Burton et al⁽¹¹⁾, reported point prevalence rates in the general British population for back pain of 12% and 15% for males and females, respectively. In the USA, data from the National Health Interview Survey, 1991, showed that 4.0 acute musculoskeletal conditions were reported per 100 persons per year⁽¹²⁾. This was for all age groups, while the rates between ages 18 and 64 years ranged from 3.2 to 5.7. The 1989 – 1990 National Health Survey in Australia found that 131.7 per thousand persons (or 13.1%) experienced recent illness involving diseases of the musculoskeletal system and connective tissue⁽¹³⁾.

Our observations of an apparently higher proportion of males and a lower proportion of Chinese among our patients with musculoskeletal symptoms are probably a reflection of the gender and ethnic profile of Singapore’s workforce. In our study, we found that production workers formed the highest proportion with work-related musculoskeletal complaints. In the 1994 Labour Force Survey⁽⁸⁾, of all employed persons, 59.8% were males with 57.0% of them in production and related occupations as opposed to 46.5% among the females. There was also a relatively lower proportion of Chinese among production workers – 69.5% as opposed to 80.2% and 80.4% among service and professional/office workers, respectively.

Considering the predominance of back complaints, the relatively higher proportion of production and service workers with musculoskeletal symptoms may be related to the nature of their job as, generally, their work tend to be more strenuous compared to that of professional/office workers. The generally higher prevalence of musculoskeletal symptoms among manual workers has been observed elsewhere⁽¹⁰⁾.

Table III – Site of musculoskeletal complaints^b, work-relatedness and medical leave given^a

	All sites	Back	Neck	Shoulders	Arms/Forearms	Hands/Wrists
All persons ^c	1,357 (100%)	55.7%	21.4%	19.2%	8.8%	7.9%
Male	799 (100%)	59.1%	21.3%	18.0%	6.9%	5.9%
Female	558 (100%)	50.9%	21.7%	20.8%	11.6%	10.8%
Employed persons ^d	1,117	621	248	211	96	79
	51.3%	55.2%	34.3%	51.2%	54.2%	65.8%
	[54.4%]	[57.6%]	[50.4%]	[53.1%]	[44.8%]	[53.2%]
Male	749	443	160	130	53	43
	55.3%	61.9%	33.8%	55.4%	56.6%	65.1%
	[56.9%]	[60.0%]	[51.3%]	[54.6%]	[43.4%]	[58.1%]
Female	368	178	88	81	43	36
	43.2%	38.8%	35.2%	44.4%	51.2%	66.7%
	[49.5%]	[51.7%]	[48.9%]	[50.6%]	[46.5%]	[47.2%]

a : All persons aged 15 years & above

b : One person may have more than one site affected

c : Figures refer to % persons with complaints

d : Figures refer to no. of persons, % with work-related complaints [and 1% given medical leave]

The higher "medical certificate rate" in our study compared to that reported in the 1993 national morbidity survey⁽⁷⁾ may reflect the relatively higher morbidity associated with musculoskeletal complaints, particularly those involving the back. It is noteworthy that service workers, including nurses, police officers, fire and security personnel, who had the highest proportion with back complaints (64.8%), also had the highest proportion given medical leave. High prevalence rates of back pain among certain service personnel, such as nurses, have been reported elsewhere⁽¹¹⁾.

We did not find any obvious association between occupation and site distribution of symptoms. Within the practical constraints of the study design, the information obtained on occupation would not be expected to allow a detailed analysis of the nature of work in relation to the site distribution of symptoms. However, it was interesting that a higher proportion of males than females had back complaints, while a higher proportion of females than males had complaints involving the hands/wrists and arms/forearms. This may reflect gender differences in the nature of work, even within the same occupational group. Thus, among production workers, males may be doing relatively heavier jobs and putting more strain on the back, while females tend to be engaged in assembly line type of repetitive work involving the hands and wrists.

In our study, 623 (or 1.8%) of the patients with musculoskeletal complaints were considered to have work-related symptoms. This rate does not seem to be high and appears comparable to the Japanese

experience. While there may be various underlying factors, including psychosocial and cultural differences, it may also be relevant to consider the occupational structure of Singapore's workforce. There has been a continual shift in the employment profile over the past decade, with the proportion of production and related workers falling steadily from 42.9% in 1984 to 35.4% in 1994⁽⁸⁾. The numbers of professional and technical personnel have also increased tremendously (by 86.3% and 105.8%, respectively).

Nevertheless, musculoskeletal complaints have a detrimental effect on morale and is associated with significant cost due to lost working time⁽¹¹⁾. A proactive approach can help reduce such problems. Emphasis should be placed on worker training (eg, proper lifting techniques to minimise back strain) and the application of good ergonomic principles, including work station design, adjustable fixtures and tool redesign, as well as administrative solutions, such as job rotation, work pacing and work breaks⁽¹⁴⁾. If effectively implemented, these measures will help minimise musculoskeletal problems and improve productivity and morale.

ACKNOWLEDGMENTS

The authors are grateful to the Ministry of Manpower for permission to quote from departmental records. They would like to thank Ms Kong Sow Lin, SRN, and Ms Lee Lee Choo for their invaluable assistance and the designated factory doctors who participated in the study for their kind co-operation.

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4th European Forum on Quality Improvement in Health Care and 4th Swedish Qul Conference

Venue : Stockholm, Sweden

Date : 25 May – 27 May 1999

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