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Etiological profile of musculoskeletal disorders of upper extremities among patients attending Physical Medicine and Rehabilitation department

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Abstract

Background

Upper extremity musculoskeletal disorders are one of the most common rheumatological conditions seeking medical advice. The diagnosis of these disorders is based primarily upon results of specific clinical tests.

There are not many studies regarding its etiological profile. The aim of this study is to assess the etiological profile of various musculoskeletal disorders of upper extremities in patients reporting to the Physical Medicine and Rehabilitation (PMR) Department of a tertiary care hospital in Kerala.

Methods

This study was carried out in the Department of PMR, Government TD Medical College, Alappuzha, during a period of one year from July 2016- June 2017 to assess the etiological profile of various musculoskeletal disorders of upper extremities.

This was a descriptive study conducted by evaluating the final diagnosis from the OP records of patients who were fully evaluated in the musculoskeletal pain clinic which is functioning in the department.

Results

Age of patients ranged between 8 to 85 years (mean age 46 years). A predominance of females was observed (Male-Female ratio: 1:1.93). The commonest etiology of upper limb musculoskeletal problem was myofascial pain around shoulder (20.5%) followed by carpal tunnel syndrome (CTS) (17.1%), rotator cuff disease (16.3%). Other main causes were adhesive capsulitis (9.8%), complex regional pain syndrome (CRPS) (8%), lateral epicondylosis (tennis elbow) (3.6%), de Quervain's tenosynovitis (2.5%) and trigger finger (2.3%). One case of malignancy (Multiple myeloma) was also diagnosed. Myofascial pain and CTS were more prevalent among younger age group. 95.7% with Myofascial pain and 76% of CTS were in the below 50 years of age category. Rotator cuff disease and adhesive capsulitis were more common in the middle and older age group. 65% of patients with rotator cuff disease and 75% with adhesive capsulitis were in the above 50 years category.

Conclusions

Myofascial pain around shoulder, CTS, rotator cuff disease and adhesive capsulitis were the most common diagnoses reporting to a tertiary care centre with upper limb musculoskeletal problem. Myofascial pain and CTS were more common in females ($P < 0.001$) and rotator cuff injury is more in males ($P < 0.001$).

The prevalence of adhesive capsulitis was almost similar in both; with a slight male predominance.

Keywords: Etiological profile, Musculoskeletal disorders of upper extremities, Myofascial pain, CTS, Rotator cuff disease, Adhesive capsulitis

1. Background

Upper extremity musculoskeletal disorders are a major health problem in the society with reported point prevalence rates ranging from 4% to 35%[1-6]. During 1995, ~3.8 million working days were lost in Britain because of upper limb disorders[7]. The resulting economic burden is considerable and increasing[8]. These disorders are associated with considerable morbidity in the general population and have a substantial social impact in terms of consumption of health care resources[9] highlighting the importance of appropriate evaluation and treatment. These disorders comprise of different clinically defined (e.g. adhesive capsulitis, tennis elbow, carpal tunnel syndrome) and undefined conditions of muscles, tendons, or nerves in the upper extremity due to multiple factors. Occupational use of the upper limbs, lifestyle disorders, psychosocial work characteristics such as high job stress[10], high job demand [11], non-work-related stress[10] and personal characteristics such as coping[12] can cause these disorders. They usually manifest as pain, discomfort, or tingling in the upper extremity[13].

Many authors repeatedly suggested that during the last decade's data are reported to indicate the increase of upper extremity musculoskeletal disorders over time in Australia, Canada, the USA, France, The Netherlands, and elsewhere [10, 14- 20] . Silverstein et al[21] reported a dramatic increase of upper extremity musculoskeletal disorders since the early 1980s in the USA affecting workers in every industry.

In 1981, 28.6% of the allowed workers' compensation claims in New York State concerned upper extremity musculoskeletal disorders and by 1986, these numbers were increased by 10.2%[22]. According to the data from the U.S. Bureau of Labour Statistics 1998a [23], in the early 1990s upper extremity musculoskeletal disorders have dramatically increased. In 2000/ 01, one in ten Canadians aged 20 or older reported that musculoskeletal disorders of upper extremities were serious enough to limit their normal activities in the previous 12 months[24]. In 2000; the Health Council of the Netherlands reported that if no distinction is made on the basis of duration or seriousness, the prevalence of upper extremity musculoskeletal disorders in the Netherlands was between 20 and 40 percent[25]. A paucity of population-based studies of musculoskeletal disorders of upper extremity exists in many countries including India.

In this study; we intended to assess the etiological profile of various musculoskeletal disorders of upper extremities. This was a hospital-based study carried out in the Outpatient Department of Physical Medicine and Rehabilitation of a tertiary care centre during a period of one year to assess the proportion of various disorders causing musculoskeletal problems of upper limb. This was a descriptive study done with secondary data from OP records, which was conducted in the 'Musculoskeletal pain clinic' functioning in the department.

Myofascial Pain (MFP)

Myofascial trigger points are quite common, especially around shoulder and cervical musculature, and are most often found in patients 31 to 50 years of age with a greater incidence in women than men. Studies indicate that myofascial pain syndrome is a far more common cause of both chronic and acute musculoskeletal pain than is generally recognized[26]. It apparently is the most common cause of the pain that brings patients to chronic pain treatment centers.

Few controlled studies have been published on the prevalence of this condition. There appears to be a female predominance, with estimates varying between 1.5:1 and

3:1. Among 283 consecutive admissions to a comprehensive pain clinic, 85% were assigned a primary organic diagnosis of myofascial syndrome[27]. Among 296 patients referred to a dental clinic for chronic head and neck pain of at least 6 months' duration, the primary diagnosis was myofascial pain in 55.4% of cases[28]. Acute myofascial pain is also common in general medical practice.

Among 61 consecutive consultation or follow-up patients in an internal medicine group practice, 10% of all patients and 31% of those presenting with a pain complaint had myofascial trigger points identified as being primarily responsible for their symptoms [29]

Rotator Cuff Disease

The prevalence of a rotator cuff tear was considerably greater in males than in females within the ages of 50–60 years old, within the ages of 70–80 years old there wasn't much difference in prevalence[30].

A study by Minagawa H et al showed that the prevalence of a rotator cuff tear in the general population is 22.1% [30.] Yamamoto et al. performed a medical examination on 683 people to determine the prevalence of a rotator cuff disease among general population. They found that, rotator cuff tears were present in 20.7%.[31]

In an autopsy study of rotator cuff diseases, the incidence of partial tears was 28%, and of complete rupture 30%. Frequently, tears occurred bilaterally and the frequency increased with age. In this study; the frequency was higher among females.[32]

Adhesive Capsulitis (AC)

Adhesive capsulitis usually affects patients aged 40-70 years. The incidence of AC is not precisely known; however, it is estimated that 2% of people develop the disease over their lifetime.

Males tend to be affected less frequently than females, and there is no predilection for race. In general, bilateral shoulder involvement is rarely simultaneous and instead occurs sequentially. The incidence of adhesive capsulitis is approximately 3 percent in the general population.[33,34] . It is rare in children and peaks between 40 and 70 years of age[34]. Women are more often affected than men, but there is no known genetic or racial predilection.

Carpal Tunnel Syndrome (CTS)

CTS is the most common compressive neuropathy. The incidence of carpal tunnel syndrome in USA is 1-3 cases per 1000 subjects per year; prevalence is approximately 50 cases per 1000 subjects in the general population. The incidence and prevalence in developed countries seems similar to the United States (eg, incidence in the Netherlands is approximately 2.5 cases per 1000 subjects per year; prevalence in the United Kingdom is 70-160 cases per 1000 subjects).[35, 36, 37]. CTS is more common in females. Many studies suggest that reason for this gender difference was due to:

1) The carpal tunnel cross sectional area relative to the size of the hand is constitutionally smaller in women than in men[38]

2) The less compliance of carpal tunnel against indentation force among females than men [39].

Aims and objectives

The aim of this study is to assess the etiology of various musculoskeletal disorders of upper extremity in patients reporting to the Physical Medicine and Rehabilitation Department of a tertiary care hospital in Kerala. There have been only few studies done in past reporting the etiological profile of musculoskeletal disorders of upper extremity.

Most of them were done in primary or secondary care centres by different investigators in different hospitals and in some the data obtained were just clubbed and reported. The results in these studies vary much due to fact that they were diagnosed by primary care physicians and also

because the disease definition itself in certain cases is ambiguous.

2. Materials and Methods

The study entitled- "Etiological profile of musculoskeletal disorders of upper extremities among patients attending Physical Medicine and Rehabilitation department" is a hospital-based study carried out in the Outpatient Department of Physical Medicine and Rehabilitation, Government TD Medical College, Alappuzha, during a period of one year from July 2016 – June 2017 to assess the etiology of various musculoskeletal disorders of upper limb.

This was a descriptive study on secondary data of hospital records conducted by evaluating the final diagnosis from the OP records of patients who were evaluated in the 'Musculoskeletal pain clinic' functioning in the department. The final diagnosis had been entered in the OP records after proper clinical evaluation and investigations by an experienced Physiatrist who was in charge of the 'Musculoskeletal pain clinic'. We excluded regional pain syndromes around neck and pain which radiates from neck to upper extremity like radiculopathy.

Statistical Analysis

A total of 560 patients who attended the 'musculoskeletal pain clinic' during the study period with musculoskeletal disorders of upper extremities were included in the study. All the data were entered in Microsoft excel sheet, rechecked and analysed with SPSS16 statistical software. For categorical variables; chi square test and for continuous variables; descriptive analysis was used in statistical analysis.

3. Results

Age of patients ranged between 8-85 years (mean age 46 years). 369 of them were females (65.9%) and 191 were males (34.1%). Predominantly right sided symptoms were seen in 76%.

The commonest causes of musculoskeletal disorders of upper extremities are given in Table 1. They were myofascial pain (20.5 %) followed by Carpal Tunnel Syndrome (17.1%), rotator cuff disease (16.3 %), adhesive capsulitis (9.8 %), Complex Regional Pain Syndrome (8 %), Tennis Elbow (3.6 %), de Quervain's Tenosynovitis (2.5%), Trigger finger (2.3 %) and Golfers elbow (1.1%). Few cases of wrist ganglion (0.89%), GH arthritis (0.5 %) and Dupuytren's contracture were also seen. 2 cases each of acromio clavicular joint arthritis and osteoarthrits of hand joints and one case of malignancy (Multiple myeloma) were also diagnosed.

Disease wise; myofascial pain and carpal tunnel syndrome were more seen in females. Rotator cuff disease was more in males. Adhesive capsulitis and CRPS were seen almost similar in both; with a slight male predominance in adhesive capsulitis (Males 9.8 % and females 8.9 %) and slight female predominance in CRPS. (Females 8.4 % and males 7.3%)

Gender wise; in females the main cause of upper limb musculoskeletal disorders was myofascial pain (28.7%) followed by carpal tunnel syndrome (22 %) and the difference was statistically significant (P value of 0.00). Rotator cuff disease was seen in 10 % of females.

While in males; the symptoms were mainly due to rotator cuff disease (30.9 %) followed by adhesive capsulitis (11.5 %) and carpal tunnel syndrome (7.8 %) difference was statistically significant (P value of 0.00) in rotator cuff disease (Table 1and Chart 1). Myofascial pain was the cause of pain around the shoulder in more than a quarter (28.7 %) of the female patients in this study. In almost one third of males; the main cause was rotator cuff disease.

Age wise etiological distribution is as follows. Myofascial pain was more among younger age group. 95.7% with Myofascial pain were in the below 50 years of age

category. Carpal tunnel syndrome was also seen more among young and middle aged. 76% with CTS were in the below 50 years of age category and 40.6% of them were in the 41 to 50 year age group. Rotator cuff disease was more common in the middle and older age group. 65% of rotator cuff disease were in the age category of above 50 years.75% of patients with adhesive capsulitis were in the above 50 years category. (Table 2 and Chart 2)

Discussion

Musculoskeletal disorders of upper extremity are common presenting complaint among patients attending the department of Physical medicine and rehabilitation (PM&R). But there have been only few studies done in past reporting the etiological profile upper extremity musculoskeletal disorders.

Most of them were conducted in the primary or secondary care centres and the results in these studies vary much due to fact that they were diagnosed by primary care physicians. Very few studies were conducted in tertiary care units where the evaluation is mainly by specialists. No similar studies were conducted in PM&R departments in India. The aim of this study is to assess the proportion of various disorders causing musculoskeletal disorders of upper extremity in patients reporting to the PM&R Department of a tertiary care hospital in Kerala.

In our study; it was found that the commonest etiology was myofascial pain, and this was more frequently seen in females and mainly in persons <50 years of age. As the studies on the prevalence of upper extremity myofascial pain was rare, we tried to see any comparison if any; exists between the results of this study with studies on the incidence of myofascial pain in general population.

Many population studies including the one by Simons D G et al[26] indicated that myofascial pain syndrome is a far more common cause of both chronic and acute musculoskeletal pain than is generally recognized. There appears to be female predominance, with estimates varying between 1.5:1 and 3:1. Skootsky S A et al[25] found that; majority of patients who got admitted to a comprehensive pain clinic, had a primary organic diagnosis of myofascial syndrome[27]. Among 61 consecutive consultation or follow-up patients in an internal medicine group practice, 10% of all patients and 31% of those presenting with a pain complaint had myofascial trigger points identified as being primarily responsible for their symptoms [29]

Carpal tunnel syndrome was the second common cause. It was also more among females and seen among younger and middle age group. 40.6% of them were in the 41 to 50 year age category.

The other common causes were rotator cuff disease and adhesive capsulitis. They were found mainly in patients older than 50 years of age and more in males. Our results are very close to the findings of the studies by *Minagawa H et al[30] on rotator cuff diseases. The study on adhesive capsulitis by Bri*dgman JF et al [34] showed that its incidence peaks between 40 and 70 years of age, but with a female predominance. In our study, adhesive capsulitis was seen almost similar in both; with a slight male predominance. (Males 11.5% and females 8.9 %).

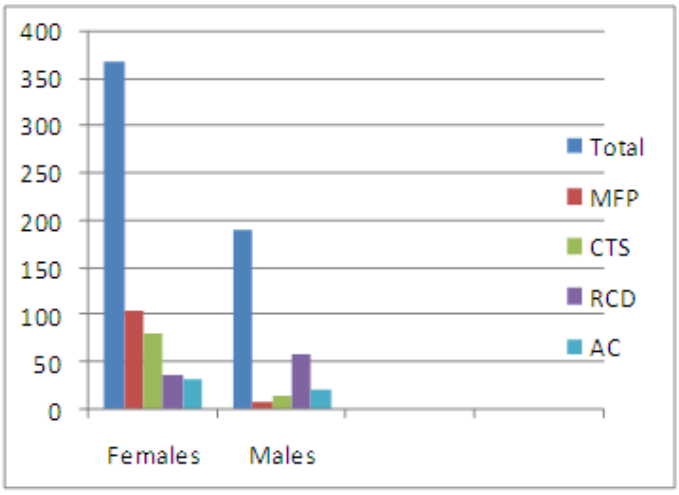
4. Tables and Charts

Table 1: Association of diagnosis with gender

Diagnosis	Total (n=560)	Females(n= 369)	Males (n=191)	P value
MFP	115 (20.5%)	**106 (28.7%)**	9 (4.7 %)	0.00
CTS	96 (17.1%)	**81 (22 %)**	15 (7.8 %)	0.00
RCD	91 (16.3%)	37 (10 %)	**59 (30.9 %)**	0.00
AC	55 (9.8%)	33 (8.9 %)	22 (11.5 %)	0.205
CPRS	45 (8 %)	31 (8.4 %)	14 (7.3%)	0.396
TE	20 (3.6 %)	15 (4.1 5)	5 (2.6)	0.268
dQTS	13 (2.3 %)	9 (2.4 %)	4 (2.1 %)	0.450
TF	12 (2.1%)	8 (2.2 %)	4 (2.1 %)	0.472
GE	6 (1.1%)	3(0.8 %)	3 (1.6%)	0.334
Ganglion	5 (0.89 %)	3 (0.8 %)	2 (1 %)	0.555
GH arthritis	3 (0.5 %)	1 (0.27 %)	2 (1 %)	0.283
Hand OA	2 (0.36 %)	2 (0.54 %)	0 (0 %)	0.472
DC	2 (0.36 %)	0 (0 %)	2 (1 %)	0.116
ACJ arthritis	2 (0.36 %)	1 (0.27 %)	1 (0.45 %)	0.566
Malignancy	1 (0.18%)	0 (0 %)	1 (0.45 %)	0.352

***MFP**: myofascial pain, **CTS**:Carpal tunnel syndrome; **RCD**: Rotator Cuff Disease, **AC**: Adhesive Capsulitis; **CRPS**: Complex Regional pain Syndrome; **TE**: Tennis Elbow; **dQTS**: de Quervains Tenosynovitis; **TF**: Trigger Finger; **GE:** Golfers elbow**; GH arthritis:** Gleno humeral arthritis**; Hand O:** Hand osteoarthritis**; DC:** Dupuytrens contracture**; ACJ arthrists:** Acromio clavicular joint arthritis*

Chart 1: Association of diagnosis with gender



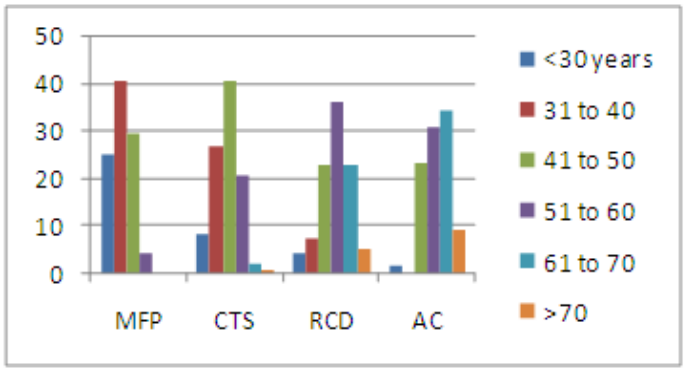
***MFP**: myofascial pain, **CTS**: Carpal tunnel syndrome **RCD**: Rotator Cuff Disease, **AC**: Adhesive Capsulitis*

Table 2: Association of diagnosis with age

Age group	MFP n (%)	CTS n (%)	RCD n (%)	AC n (%)
<30 years	29 (25.2 %)	8 (8.3 %)	4 (4.4 %)	1 (1.8 %)
31 -40 years	47(40.9 %)	26 (27.1 %)	7 (7.7 %)	0 (0 %)
41 -50 years	34 (29.6 %)	39 (40.6 %)	21 (23.1 %)	13 (23.6 %)
51 -60 years	5 (4.3 %)	20 (20.8%)	33 (36.3 %)	17 (30.9 %)
61 -70 years	0 (0 %)	2 (2.1%)	21 (23.1 %)	19 (34.5 %)
>71 years	0 (0 %)	1 (1.0%)	5 (5.5 %)	5 (9.1 %)

***MFP**: myofascial pain, **CTS**: Carpal tunnel syndrome, **RCD**: Rotator Cuff Disease, **AC**: Adhesive Capsulitis*

Chart 2: Association of diagnosis with age



***MFP**: myofascial pain, **CTS**: Carpal tunnel syndrome **RCD**: Rotator Cuff Disease, **AC**: Adhesive Capsulitis.*

4. Conclusions

1. This is the first report on etiological profile of the upper extremity musculoskeletal disorders reporting to Physical Medicine and Rehabilitation department of a tertiary care centre in India, especially assessing the age and gender related proportion.
2. The common causes of musculoskeletal disorders of upper extremity were myofascial pain (20.5 %) followed by carpal tunnel syndrome (17.1 %), rotator cuff disease (16.3 %) and adhesive capsulitis (9.8 %).
3. Myofascial pain was the commonest cause among females. It was seen in 28.7 % of them with upper extremity musculoskeletal disorders.

4. Carpal tunnel syndrome was the second common etiology of musculoskeletal disorders of upper extremities and was also more common in females.
5. In males; the main etiology was rotator cuff disease (30.9 %) and a statistically significant gender difference was evident.
6. Adhesive capsulitis was slightly more in males but the association was not statistically significant.
7. Myofascial pain was seen more in young persons, carpal tunnel syndrome in young and middle aged and the occurrence of rotator cuff disease and adhesive capsulitis were more seen after 50 years of age.

5. Limitations of the study

It was a hospital based study conducted in a tertiary care centre, and hence may not be representative of general population.

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