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Clinical and Functional Profile of Patients with the Painful Shoulder Syndrome (PSS)

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SUMMARY

Background. The Painful Shoulder Syndrome (PSS) is characterized by varying degrees of pain and functional limitation. The aim of this study is to describe the clinical and functional profile of these patients.

Material and methods. 136 patients undergoing clinical treatment for PSS were evaluated by a questionnaire regarding the following variables: sex, age, occupation, affected shoulder and its dominance, image diagnosis, pain location, intensity and characteristics, physical activity involving the shoulder, preferential position of upper limbs during occupational activity, limitation of movements during activities o daily living, and job absenteeism.

Results. 74.3% of the patients were women ($p<0.001$), and 54.4% were at or below the mean age of 50±12.5 years. The right shoulder was affected most frequently (58.8%) and dominant (91.9%). Rotator cuff tear was the most frequent shoulder pathology (75.4%). Treatment was sought more commonly in the chronic stage of pain (61.0%). Pain, moderate in intensity, predominated in males (54.3%) and severe pain was more frequent in females (47.5%), restricted to the shoulder in 44.1% and worsening at night (50%). The upper limbs were used more frequently below shoulder level during usual daily activities (68.4%), and limitation of movements was present mainly in women (63.4%, $p=0.017$).

Conclusion. 1. Rotator cuff tear is the most frequent cause of PSS. 2. PSS produces pain and functional limitation, especially in women.

Key words: shoulder pain, pain, rotator cuff, physiotherapy

BACKGROUND

The Painful Shoulder Syndrome (PSS) is characterized by varying degrees of pain and functional disability secondary to lesions of the structures responsible for shoulder movement, including joints, tendons, muscles, ligaments and bursas [1]. It is the second most common cause of pain in the locomotor system, second only to low back pain; it mainly affects those in the most productive age group, and can lead to early retirement with serious economic, social and psychological consequences [2].

Pain is a very frequent complain, usually associated with repetitive upper limb activities such as occur while doing housework, typing, and certain activities performed by free-lance professionals and athletes that may disturb the biomechanical integrity of the shoulder [3]. During evaluation of the patient, many clinical, socio-demographic and epidemiologic factors may point out to conditions that predispose to shoulder pain [4].

It is fundamental to define the clinical and functional profile of patients with the PSS in order to obtain a better knowledge of this condition. Nevertheless, studies of this subject are scarce. An awareness of PSS and its functional sequelae aids in choosing more suitable therapeutic and preventive measures, thus avoiding the social and economic costs to the patients. Therefore, the aim of this study is to describe the clinical and functional profile in a selected population of patients with PSS, followed up in a private clinic.

MATERIAL AND METHODS

This is a descriptive study involving patients with PSS who attended a private physiotherapy clinic in the city of Salvador, Bahia, Brazil, in the period between May 2006 and May 2007, met the inclusion criteria and consented to participate in the study.

Inclusion criteria included patients referred to the clinic with shoulder pain related to conditions like rotator cuff syndrome, shoulder instability, frozen shoulder, arthrosis and bursitis according to Fellet et al. [1], 2000. On the other hand, exclusion criteria included patients with fractures, and those who had surgery, cancer, the shoulder-hand syndrome secondary to stroke or acute myocardial infarction, or refused to sign an informed consent form. The study was approved by the Ethical Review Board of the Bahian School of Medicine and Public Health.

The sequential sampling included 136 patients, guaranteeing a precision of 0.06 and an alpha error of 0.05.

Data collection was performed through a questionnaire (Painful Shoulder Protocol) based on a numeric visual scale [5] for pain intensity, Mc Gill Questionnaire [6] and the Barthel Index [7] for some items with reference to pain and function, both validated internationally. The questionnaire was applied individually and the presence of limitation of shoulder movements was evaluated subsequently.

The following variables were analysed for association with the PSS: referral diagnosis according to the ICD-10, gender, age, occupation, affected shoulder, upper limb dominance, pain location, type, intensity, duration, and circadian pattern, type of physical activity involving the shoulder and upper limbs, type and degree of functional disability, particularly with regard to routine daily activities, professional and/or basic, such as eating, bathing, hygiene and dressing, and job absenteeism.

Continuous variables were presented as mean standard deviation, and categorical variables as proportions. Two proportions were compared by the Pearson chi-square Test or Exact Fisher test, as appropriate. The significance level was < 0.05. The analyses were performed with the Statistical Package for the Social Sciences (SPSS Chicago - IL, version 9.0, 1998)

RESULTS

Table 1 shows that women predominated (101 [74.3%], $p<0.001$) among the 136 patients with PSS. Patients' age ranged from 30 to 88 years, for a median of 50 years, with more men [25/35 (71.4%)] below this age, and more women [52/101 (51.5%)] above it ($p<0.019$). The right upper limb was the dominant one in the majority of the patients [125 (91.9%)], and the right shoulder was more affected in women ($p=0.042$). Most of these patients reported physical activities involving the affected shoulder (65.2%), but no gender-related differences were observed. Typing, housework and some professional activities were the most common types of occupational activity reported, with the distribution significantly different between men and women ($p<0.001$), due to the almost no domestic activities reported by men (2.9% versus 45.5%). As regards leave from work, an almost significant proportion of the patients (76.5%, $p=0.055$) remained active.

Analysis of the characteristics of pain (Table 2) shows that chronic pain was 1.6 times more frequent than acute pain, occurring specially in women (63.4% versus 54.3%, $p=0.017$), and on movement (44.9%). Assessed by a visual numeric scale, pain of moderate intensity was more frequent in men

(54.3%) and severe pain in women (47.5%), with an overnight peak (50%), and limited to the shoulder area (60, 44.1%).

The main functional aspects of PSS are shown in Table 3. For the majority of the patients [93 (68.4%)], their daily activities were performed with the upper limbs below shoulder level, particularly in women [70 (69.3%, p<0.001)], who also demonstrated functional disability more frequently [63.4% versus 36.6% (p=0.017)]. This was also observed regarding their ability to cater for their individual needs, especially getting dressed (p=0.008), as compared with men.

Ultrasonography was the most common diagnostic imaging modality (63.8%), followed by X-ray (48.5%) and magnetic resonance imaging (32.3%) (Table 4). Tendonitis was the most frequent image diagnosis (66.2%), and 29 (22.3%) patients had a normal result. Furthermore, Table 5 shows that the rotator cuff syndrome was the most common referral diagnosis as compared with the total of all other diagnoses [95 (75.4%) versus 31 (24.6%), p<0.001].

DISCUSSION

This sample was characterized by a predominance of women with the PSS, especially above the median age of 50 years, who presented with more intense pain and more disability when compared with men. These findings are compatible with a previous report (Dias et al [8]) of a similar sample, and those of Camargo et al. [9], who studied shoulder pain and disability in workers with an "impact syndrome". There is a possibility that women are more vulnerable to shoulder lesions due to factors like menopause, smaller upper limb mass giving support to the shoulder joint, type of repetitive trauma, especially in their domestic activities, and a lower pain threshold [10].

Tab. 1. Clinical characteristics of the Painful Shoulder Syndrome, according to gender, Salvador, 2007

Categorical Variables	Total	Men n (%)	Women	p
Gende	136 (100	35 (25.7)	101 (74.3)	**<0.001***
Age (years)				
Median				
≤ 50 years	74 (54.4)	25 (71.4)	49 (48.5)	**0.019**
> 50 years	62 (45.6)	10 (28.6)	52 (51.5)	
Member Dominance				
Right	125 (91.9)	29 (82.9)	96 (95.0)	**0.023**
Left	11 (8.1)	6 (17.1)	5 (5.0)	
Affected Shoulder				
Right	80 (58.8)	18 (51.4)	62 (61.4)†	
Left	56 (41.2)	17 (48.6)	39 (38.6)	
Physical Activity involving the shoulders				
Yes	30 (65.2)†	9 (30.0)	21 (70.0)	
No	16 (34.8)	4 (25.0)	12 (75.0)	
Occupation				
Typing	53 (39.0)	19 (54.3)	34 (33.7)	
Domestic Activities	47 (34.6)	1 (2.9)	46 (45.5)	
Professional Activities	36 (26.5)	15 (42.9)	21 (20.8)	
Inability to work 118‡ (75.2)				
Yes	24 (23.5)	2 (8.0)	22 (28.6)	
N o	78 (76.5)	23 (92.0)	55 (71.4)	**0.055**

*Statistics: comparison of percentages in the horizontal lines: Men vs. Women
† Comparison of percentages in the vertical lines: Affected Shoulder, women: p=0.042; Physical Activity involving the Shoulder, total: p=0.097.
‡ Total number of patients in the sample from whom information was obtained.

Tab. 2. Distribution of the semiological characteristics of pain in the Painful Shoulder Syndrome, total and according to gender, Salvador, 2007

Categorical Variables	Total	Men	Women
		n (%)	
	136 (100)	35 (25.7)	101 (74.3)
Duration of pain			
Chronic (over 3 months)	83 (61.0)	19 (54.3)	64 (63.4) *
Acute (up to 1 month)	53 (39.0)	16 (45.7)	37 (36.6)
Type of pain			
On movement	61 (44.9)	18 (51.4)	43 (42.6)
Constant	36 (26.5)	7 (20.0)	29 (28.7)
Intermittent	36 (26.5)	9 (25.7)	27 (26.7)
At rest	3 (2.2)	1 (2.9)	2 (2.0)
Pain intensity by Visual Numerical Scale:			
Weak pain (1 to 3)	17 (12.5)	8 (22.9)	9 (8.9)
Moderate pain (4 to 6)	49 (36.0)	19 (54.3)	30 (29.7)
Strong pain (7 to 9)	55 (40.4)	7 (20.0)	48 (47.5)
Unbearable pain (10)	15 (11.0)	1 (2.9)	14 (13.9)
Most painful period of the day			
Night	68 (50.0)	15 (42.9)	53 (52.5)
Morning	32 (23.5)	9 (25.7)	23 (22.8)
At any time	29 (21.3)	9 (25.7)	20 (19.8)
Afternoon	7 (5.1)	2 (5.7)	5 (5.0)
Location of pain			
Shoulder	60 (44.1)	21 (60.0)	39 (38.6)
Shoulder to elbow	31 (22.8)	6 (17.1)	25 (24.8)
Between neck and shoulder	19 (14.0)	5 (14.3)	14 (13.9)
Shoulder to hand	19 (14.0)	2 (5.7)	17 (16.8)
Shoulder to neck	5 (3.7)	1 (2.9)	4 (4.0)
From neck to hand	2 (1.5)	----	2 (2.0)

* Comparison of percentage in vertical, women, (Duration of pain) p=0.017.

The right shoulder was the most affected, not surprisingly, considering the very high proportion of dominance of the right upper limb, which was very often used in an incorrect manner, without previous muscular stimulation, thus predisposing the patient to shoulder tendon and ligament lesions. These could be aggravated by the biomechanical movements performed during occupational activities, such as domestic activities, here found as the occupation most frequently performed by women. These results corroborate those of Facci [11], who also found the right shoulder to be affected the most often in their research on the painful shoulder syndrome.

The findings are also in agreement with those of Leclerc et al. [12], who found a greater incidence of shoulder pain in women, increase in prevalence with age, and association with repetitive work in a period of six months of follow-up. It was verified that PSS was associated with work when the arms were above shoulder level among women, and repetitive manual work with load in men. Nevertheless, in the present study, patients used their hands more frequently below shoulder level to perform their activities, which can be justified by the high proportion of typing (39.0%) and domestic activities (34.6%) in the sample of the present study.

In the present study, no statistical significance was found between occupations and PSS, although there are studies that prove this relationship [13, 14,15]. According to Mendonça Jr. et al [15] in their review study, shoulder disturbances are influenced by biomechanical factors related to work, such as prolonged flexion or abduction of the shoulders, vibrations, static posture or loading of the upper limb.

Tab. 3. Functional aspects of the Painful Shoulder Syndrome, total and according to gender, Salvador, 2007

Categorical Variables	Total	Men n (%)	Women	p
	136 (100)	35 (25.7)	101 (74.3)	
Position of upper limbs in occupations				
Below the shoulders	93 (68.4)*	23 (65.7)	70 (69.3)*	
At shoulder height	35 (25.7)	11 (31.4)	24 (23.8)	
Above the shoulders	8 (5.9)	1 (2.9)	7 (6.9)	
Degrees of limitation				
Without limitation	54 (39.7)	17 (48.6)	37 (36.6)*	
Slightly limited	37 (27.2)	8 (22.9)	29 (28.7)	
Moderately limited	34 (25.0)	10 (28.6)	24 (23.8)	
Highly limited	11 (8.1)	----	11 (10.9)	
Types of limitation:				
1) Eating				
Independent	125 (91.9)	34 (97.1)	91 (90.1)	**0.288**
Need help	11 (8.1)	1 (2.9)	10 (9.9)	
2) Bathing				
Independent	123 (90.4)	34 (97.1)	89 (88.1)	**0.183**
Need help	13 (9.6)	1 (2.9)	12 (11.9)	
3) Hygiene				
Independent	129 (94.9)	35 (100)	94 (93.1)	**0.190**
Need help	7 (5.1)	----	7 (6.9)	
4) Dressing				
Independent	113 (83.1)	34 (97.1)	79 (78.2)	**0.008**
Need help	23 (16.9)	1 (2.9)	22 (21.8)	

* Comparison in the vertical lines: 1) Position of upper limbs in occupations: Below the shoulders vs. at shoulder height e Above the shoulders, total and women, p<0.001; Degrees of limitation: Without limitation vs. Any limitation (women), p=0.017.

In the patient population of this study, however, there was a trend towards this association, because occupations such as typing and domestic tasks corresponded to 73.6%. It is believed that due to lack of a suitable classification in the literature, this association could not be satisfactorily evaluated.

Being unable to carry out work very frequent (23.51%) in the sample. In some way, PSS could be part of a set of pathologies that characterize lesions due to repetitive efforts, also known as Work Related Musculoskeletal Disorders. These diseases lead to long periods of inability to work, health care expenses, as well as reduced quality of life and disability [2,14,16,17]. This percentage should therefore be considered relevant and of socioeconomic importance.

The clinical diagnosis (ICD-10) of PSS in the present study, in the majority of patients, was the rotator cuff syndrome (75.4%). Andrade et al. [9] and Nové-Josserand et al. [18] reported that rotator cuff lesions are the most frequent cause of PSS, being associated with the natural process of aging, their incidence increasing with advancing age. Nevertheless, the results of the present study point towards a greater incidence in men under the age of 50 years.

On the other hand, one could observe that the rotator cuff tear, either in isolation or in association with other pathologies, was the most frequent image diagnosis in the entire sample. Diagnoses such as arthropathy and instability were shown to be less frequent.

Many factors predisposing to shoulder pain have been well established, such as age, the natural degenerative process of aging and physical occupational demands. According to Moosikasuwan et al. [19], approximately 40% of asymptomatic patients over the age of 50 years have complete rupture of the rotator cuff and the prevalence of partial or complete rupture in symptomatic patients over the age of 60 years is higher than 60%.

Physical activity can contribute greatly to shoulder lesions. PSS was more common in the patients

Tab. 4. Complementary imaging examinations of patients with Shoulder Pain Syndrome, Salvador, 2007

	Total	Isolated	Associated Complementary Examinations
	N = 130 (%)		
Ultrasonography	83 (63.8)	32 (24.6)	51 (39.2)
Radiography	63 (48.5)	20 (15.4)	43 (33.1)
Magnetic Resonance / Arthro-resonance	42 (32.3)	6 (4.6)	36 (27.7)
Computerized Tomography	2 (1.5)	1 (0.8)	1 (0.8)
Associations			
US + RX	35 (26.9)		
US + RM	28 (21.5)		
US + RX +RM	12 (9.2)		
RX + RM	20 (15.4)		
RX + TC	1 (0.8)		
RX +RM + TC	1 (0.8)		
Did not have exams performed	12 (9.2)		
Image Diagnosis	**130* (95.6)**		
Tendonitis	86 (66.2)		
Arthropathy	35 (26.9)		
Bursitis	24 (18.5)		
Other unspecified lesions of the shoulder	9 (6.9)		
Instability + SLAP Lesion‡	1 (0.8)		
Normal	29 (22.3)		

Note: absolute values may exceed 130 due to some patients having had more than one complementary exam performed.
* Number of patients in the total sample who had examinations performed
† Comparison of percentages in the vertical lines: Reference Diagnosis: rotator cuff syndrome vs. others, p<0.001.
‡ SLAP (Superior labrum anterior-posterior).

Tab. 5. Diagnostic aspects of the Painful Shoulder Syndrome, total and according to gender, Salvador, 2007

Categorical Variables	Total	Men n (%)	Women
	136 (100)	35 (25.7)	101 (74.3)
Reference Diagnosis	**126* (96.9)**		
Rotator Cuff Syndrome	95 (75.4)†	28 (80.0)	67 (73.6)
Unspecified Lesion	11 (8.7)	2 (5.7)	9 (9.9)
Frozen shoulder	8 (6.3)	2 (5.7)	6 (6.6)
Cervicalgia	8 (6.3)	1 (2.9)	7 (7.7)
Instability / Luxation	3 (2.4)	2 (5.7)	1 (1.1)
Arthrosis	1 (0.8)	-	1 (1.1)

* Number of patients in the total sample who had examinations performed
† Comparison of percentages in the vertical lines: Reference Diagnosis: rotator cuff syndrome vs. others, p<0.001.

who practiced physical activity involving the shoulder. Overuse of the shoulder in sporting activities predisposes to lesions. Strike sports, for example, swimming, volley, tennis, strength training workouts, basketball and sports that involve martial arts, could function as predictors of PSS [20,21,22,23]. According to Cavallo [21], the lesions in MMSS represent around 75% of general lesions and the shoulder is the most affected region on the scenario of these sports.

This study represents high internal validity, as all the patients studied were evaluated by the researcher herself, and the evaluation instrument used was ba-

sed on internationally validated scales, questionnaire and indices. Nevertheless, the study has low external validity, since it was done with a convenience non-populational sample. This limits extrapolation of the results to the general population. However, the study proposed to evaluate only patients that sought treatment for PSS, and therefore, the objective of contributing to a better approach to and, consequently, evaluation and treatment, especially of a preventative nature, of this population was attained.

The fact that women are more predisposed to develop PSS, feel more intense pain and consequently present with greater limitation of shoulder movements could substantially alter the quality of life of this group. The data of the present study, however, need to be ratified by other prospective or populational studies.

CONCLUSIONS

1. It was concluded that PSS was more frequent among women.
2. The rotator cuff syndrome was the most frequent diagnosis.
3. PSS produces pain and functional limitation, especially in women.

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