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Associated Diseases and Treatment Pattern of Frozen Shoulder Patients Attending to Orthopedic and Physiotherapy Department of Selected Hospitals

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Abstract:

A descriptive type of cross sectional study was conducted to determine the associated diseases and treatment pattern of frozen

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shoulder patients attending to orthopedic and physiotherapy department of selected hospitals with a sample size of 300. A pre-tested, modified, semi-structure questionnaire was used to collect the data which were entered and analyzed by using SPSS. Purposive sampling method was used to collect data and verbal consent was taken prior interview. Study revealed that, 1%, 38%, 51% and 10% of the respondents belongs to age of 21-25 years, 26-45, 46-65 and 66-83 years respectively with mean age 51.66 + 13.406. Study found 52% male and 48% female. Among the respondents 34%, 27%, 26%, 9%, and 4% were retired person, service holder, house wife, workers and students. About 59%, 30% and 11% of the respondents complained moderate, severe and mild pain. Besides 60% respondents complained muscle spasm. Left, right and both shoulder was frozen among 48%, 46% and 6% subjects. Regarding associated diseases of the respondents, 58% degenerative disease of cervical spine, 41% diabetic mellitus, 27% cardiac diseases, 24% gout and 12% were post fracture and dislocation around the shoulder. Of the respondents 52% were suffering stage2, 35% stages1 and 13% stages3 frozen shoulder. Treatment patterns of those patients 98% received medication, 9% infiltration and, 80% were physiotherapy services including 86% shoulder mobilization, 91% electrotherapy, 51% strengthening exercise and 23% were capsular stretching. Before and after physiotherapy treatments mean shoulder range of movement 18 + .10.305^{0}and 67 + 9.401^0. There was highly significant association between physiotherapy treatment with monthly income and electrotherapy modalities (P=0.000<0.05). Middle and advance age people were more prone to frozen shoulder, and associated diseases of frozen shoulder were degenerative, metabolic, cardiac diseases, post fracture and dislocation.

Key words: Frozen shoulder, Physiotherapy

Introduction

Frozen shoulder is a common and disabling condition in which severe spontaneous shoulder pain is initially associated with

capsular tenderness and painful restriction of all shoulder movements and later with painless restriction of movement alone.[1] A statistically significant improvement in range of movement, function and pain intensity was obtained following manipulation.[2] Improvements in flexion, inner and outer rotation values were significantly higher, when we compared the differences between post- and pre-treatment values of shoulder ROM.[3]Cost-effectiveness analysis suggested that steroid alone may be more cost-effective than steroid plus physiotherapy or physiotherapy alone.[4] Combining mobilization with exercise resulted in additional benefit when compared to exercise alone for rotator cuff disease. Laser therapy, ultrasound was demonstrated to be more effective of adhesive capsulitis.[5] A single-blinded, randomized controlled study done and found that a significant improvement was seen in all groups in all outcome measures except for that of shoulder flexion range.[6] Primary frozen shoulder (FS) is a painful contracture of the glenohumeral joint with an increased amount of collagen, fibrotic growth factors such as transforming growth factor-beta, and inflammatory cytokines such as tumor necrosis factor-alpha and interleukins.[7] Adhesive capsulitis is a condition best way best to manage patients with an evidence-based overview regarding the effectiveness of conservative and surgical interventions to treat adhesive capsulitis.[8] Adhesive capsulitis patient 40.8% of patients presented with back pain, 20.9% with neck pain and 11.5% with shoulder pain.[9] A physical treatment method for adhesive capsulitis, it is extremely important to consider the patient's symptoms, stage of the condition, and recognition of different patterns of motion loss.[10] The arthroscopic capsular release does not have significant impact on the decrease in the muscular strength of the operated frozen shoulder.[11] As tear size increased, range of glenohumeral motion in horizontal abduction after repair decreased gradually and was significantly decreased with the large size tear

($P < 0.01$).[12] Based on this small service evaluation study, corticosteroid injection administered by an experienced physiotherapist with follow-up physiotherapy appears to be an effective treatment for frozen shoulder.[13] Among the frozen shoulder patients, 24.2% had diabetes and 16.5% had history of shoulder trauma. No significant difference was found in occupations, physical exercise, and history of surgical and ischemic heart disease.[14]

Methodology

It was a descriptive type of cross sectional study was conducted of Dhaka city in order to assess associated diseases and treatment patterns of frozen shoulder patients attending to orthopedic and physiotherapy department of selected hospitals with a sample size of 300. The study sites were National Institute of Traumatology and Orthopedic Rehabilitation (NITOR), Shere-Banglanagor, Dhaka Metropolitan Medical Centre Limited (MMC Ltd) Mohakhali, Dhaka and Islami Bank Central Hospital Limited (IBCH Ltd), Kakrail, Dhaka. Data were collected those patients who were attending different serviced in Orthopedic and Physiotherapy departments and study period was of 1st June 2013 to 31st July 2014. A pre-tested modified semi structure questionnaire was used to collect the information on the basis of objectives and variables. All laboratory and X-ray investigations were done in IBCH and MMC Ltd also MRI was done Ibna Sina, popular, Lab Aid and Medinova diagnostic Centre. Patients were individually diagnosis by clinically observed sign, symptoms and related investigations. The collecting data were editing and analyzed by using statistical packages for social science (SPSS) software version 16. After collection of data, all responses checked for their completeness, correctness and internal consistency in order to exclude missing or inconsistent data. Corrected data

was entered into the computer. The data was analyzed by using the statistical software namely SPSS (Statistical Package for Social Science). Data analysis was done according to the objectives of the study. P-value more than 0.05 was considered insignificant.

Results

Table 1 shows that, 1%, 38%, 51% and 10% of the respondents belongs to age of 21-25 years, 26-45 years, 46-65 years and 66-83 years with mean age 51.66 $\pm$ 13.406 years. Among them 52% were male and 48% were female respectively. Table also reveals that occupation of the respondents were 34% retired person, 27% service holder, 26% house wife, 9% workers and only 4% students. Among them 58%, 31% and 11% of the respondent's monthly incomes was 10000-30000 BDT, more than 30000 BDT and less than 10000 BDT respectively.

Table 1 Distribution of the respondents by Socio-demographic variables (n=300)

	Items	**Frequency**	**Percentage**
Age group	21- 25	3	1
	26-45	114	38
	46-65	153	51
	66-83	30	10
	Total	300	100
	Mean $\pm$ SD	51.66 $\pm$ 13.406	
Sex	Male	156	52
	Female	144	48
	Total	300	100
Occupation	Student	12	4
	Service holder	81	27
	Retired person	102	34
	Worker	27	9
	House wife	78	26
	Total	300	100
Monthly	>30000 BDT	93	31
	10000-30000 BDT	174	58

income	< 10000 BDT	33	11
	Total	300	100

Table 2 reveals that 59% of the respondents were suffering moderate pain, 30% severe pain and 11% were mild pain respectively. Table also shows that muscle spasms were prominent symptoms among 60% respondents and 40% were absent.

Table 2 Distribution of the respondents by symptoms related variables (n=300)

Severity of pain	**Items**	**Frequency**	**Percentage**
	Mild	33	11
	Moderate	177	59
	Severe	90	30
	Total	300	100
Radiating pain	Yes	174	58
	No	126	42
	Total	300	100
Muscle spasm	Present	180	60
	Absent	120	40
	Total	300	100

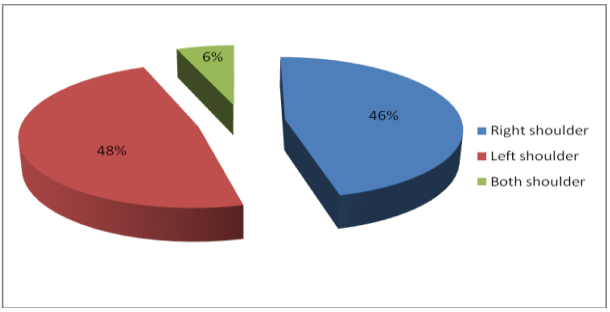

Figure 1 Distribution of the respondents by side determination

Figure 1 show that 48%, 46% and 6% were suffering from left, right and both frozen shoulder.

Table 3 shows that 93%, 92% and 31% did investigation of blood, x-ray and MRI respectively. Associated diseases of the respondents 58% were degenerative disease of cervical spine, 41% diabetic mellitus, 27% cardiac diseases, 24% gout and 12% post fracture and dislocation around the shoulder respectively. Of them 52% respondents were stage 2 frozen shoulders, 35% stages 1 frozen shoulder and 13% were stages 3 respectively.

Table 3 Distribution of the respondents by investigations and diagnosis

Type of Investigations (Multiple responses)	**Item**	**Frequency**	**Percent**
	Blood	279	93
	X-ray	276	92
	MRI	93	31
Associated diseases (Multiple responses)	Degenerative disease of cervical spine	174	58
	Diabetes mellitus	123	41
	Post fracture and dislocation around the shoulder	36	12
	Cardiac disease	81	27
	Gout	72	24
Stages of frozen shoulder	stage 1	105	35
	stage 2	156	52
	stage 3	39	13
	Total	300	100

Table 4 reveals that 98% respondents received medication, 80% physiotherapy and 9% infiltration respectively.

Table 4 Distribution of respondents by different treatment (Multiple responses)

Types of treatment	**Frequency**	**Percentage**
Medication	294	98
Infiltration	27	9
Physiotherapy	240	80

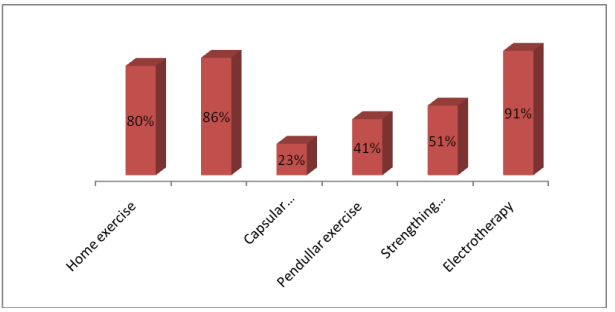

Figure 2 Distribution of the respondents by type of Physiotherapy

Figure 2 shows that treatment checking behavior of the respondents. They took different types of physiotherapy services including 86% shoulder mobilization, 80% home exercise, 91% electrotherapy, 51% strengthening exercise, 41% pendulum exercise and 23% capsular stretching.

Table 5 shows that 98% of the respondents feel better after treatment and rest of them 2% were no progress. Among them 18% respondent had no pain, 54% mild pain and 28% were moderate pain after treatment.

Table 5 Distribution of the respondents by pain responses after treatment (n=300)

Pain responses after treatment	**Items**	**Frequency**	**Percent**
	Better	294	98
	No progress	6	2
	Total	300	100
Types of pain responses after treatment	No pain	54	18
	Mild	162	54
	Moderate	84	28
	Total	300	100

Table 6 reveals that 50,34%, 37.33%, 10%, 2% and 0.33% of the respondents had shoulder range of movements of $0\text{-}20^0$, $21\text{-}40^0$, $41\text{-}60^0$, $61\text{-}80^0$ and $80\text{-}90^0$ with mean shoulder range of movement $18 \pm .10.305^0$ before treatment. After two weeks

physiotherapy treatment 0.67%, 2.33%, 36.33%, 51% and 9.67% of the respondents shoulder range of movements was $0\text{-}20^0$, $21\text{-}40^0$, $41\text{-}60^0$, $61\text{-}80^0$ and $80\text{-}90^0$ with mean shoulder range of movement 67 ± 9.401^0.

Table 6 Distribution of the respondents by range of shoulder abduction before and after treatment (n=300)

Range of movement (Degree)	Before treatment		After treatment	
	Frequency	Percentage	Frequency	Percentage
0-20	151	50.34	2	0.67
21-40	112	37.33	7	2.33
41-60	30	10	109	36.33
61-80	6	2	153	51
81-90	1	0.33	29	9.67
Total	300	100	300	100
Mean $\pm$ SD	$18 \pm .10.305$		67 ± 9.401	

Table 7 reveals that a highly significant association between physiotherapy treatment and monthly income of the respondents (P value = 0.000).

Table 7 Distribution of respondents by association between physiotherapy treatment and monthly income (n=300)

Physiotherapy treatment	Monthly income				P-Value
	Above 30000 BDT	10000-30000 BDT	Below 10000 BDT	Total	
Yes	93	171	21	285	0.000
No	0	3	12	15	
Total	93	174	33	300	

Table 8 shows that a highly significant association between physiotherapy treatment and electrotherapy modalities (P value = 0.000).

Table 8 Distribution of respondents by association between physiotherapy treatment and electrotherapy modalities (n=300)

Physiotherapy treatment	Electrotherapy modalities			P-Value
	Yes	No	Total	
Yes	249	36	285	.000
No	0	15	15	
Total	249	51	300	

Discussion

The study shows that, 1%, 38%, 51% and 10% of the respondents belongs to age of 21-25 years, 26-45 years, 46-65 years and 66-83 years with mean age 51.66 $\pm$ 13.406 years. These findings were similar to the findings of Hand C et. al.[15] Among respondents 52% was male and 48% was female. These findings were dissimilar to the findings of Li W et. al.[14] Besides 59% of the respondents were suffering from moderate pain, 30% severe pain and 11% mild pain respectively. Of them muscle spasm were prominent symptoms. These findings were supported to the study carried out by Murphy FX et. al.[16] Regarding associated diseases of the respondents, 58% were degenerative disease of cervical spine, 41% diabetic mellitus, 27% cardiac diseases, 24% gout and 12% were post fracture and dislocation around the shoulder respectively. Of them 52% respondents were stage 2 frozen shoulders, 35% stages 1 frozen shoulder and 13% were stages 3 respectively. These findings were similar to the findings of Bablis P and Li W et. al. editors.[9, 14] Among the respondents 48% were left, 46% were right and rest of 6% were affected both shoulder. Of the respondent 93%, 92% and 31% did blood, x-ray and MRI investigation respectively. There were no similar findings such literature review of the study. Study reveals that 98% respondents received medication, 80% physiotherapy and 9% infiltrations respectively. These findings were similar to the findings of Green S et. al. editors.[5] Respondents took different

types of physiotherapy services including 86% shoulder mobilization, 80% home exercise, 91% electrotherapy, 51% strengthening exercise, 41% pendulum exercise and 23% capsular stretching. This study supported to the study carried out by Maund E et. al. editors.[4] Before treatments mean shoulder range of movement was $18 \pm .10.305^0$ and after two weeks physiotherapy treatment mean shoulder range of movement was 67 ± 9.401^0. These findings were similar to the study of Farrell CM, Flannery O and Murphy FX et. al. editors.[16,17] Two highly significant association between physiotherapy treatment with monthly income of the respondents and electrotherapy modalities (P value = 0.000 and 0.000). These findings were supported to the study carried out by Cheing GL et. al. editors**.**

Conclusion:

Middle and advance age people were more prone to frozen shoulder and associated diseases of frozen shoulder were degenerative disease of cervical spine, diabetic mellitus, cardiac diseases, gout, post fracture and dislocation around the shoulder. Role of physiotherapy regarding range of movement was tremendous.

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