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Impact of shoulder pain and disability on the quality of life among cerebrovascular accident patients of Surat, Gujarat

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Abstract
Cerebrovascular accidents (CVA) are a major cause of disability worldwide Prevalence of cerebrovascular accident in rural India is 1.1% and urban India 1.9%. Post-stroke shoulder pain is a common impairment affecting patients' participation in rehabilitation by discouraging motion; hindering recovery; and adversely affecting function. Results of this study showed that 61.43% patients (n= 43) had significant shoulder pain which can be considered as prevalent. It was also reported that approximately 60% (n=42) patients suffered from mild to moderate disability associated with shoulder pain. It was found that pain score, disability score and total score of SPADI were significantly correlated with psychological health, social relationship and physical health domains of WHOQOL-BREF

Keywords: stroke, shoulder pain, quality of life, disability, physical therapy, rehabilitation

Introduction

World Health Organization (WHO) defined, Cere bro vascular accident (CVA) as a clinical syndrome consisting of rapidly developing clinical sign of focal disturbance of cerebral function lasting > 24 hours or leading to death without apparent cause other than vascular origin [1]. Worldwide incidence of CVA is 1.5 - 2 per 1000 population [2]. In India, the estimated prevalence of CVA ranges from 2-2.5 per 1000 population [3]. Age specific incidence of CVA is reported to be 0.1-0.3 cases per 1000 per year for <45 years and increases to 12-20 cases per 1000 per year for 75-84 year [2].

Motor impairments (weakness, altered tone, abnormal synergy and reflexes, altered voluntary control, etc.); issues of balance and postural control; sensory impairments (e.g. pain, abnormal sensations, visual changes etc.); speech, language and swallowing impairments; cognitive and perceptual impairments and bladder-bowel problems are primary impairments associated with CVA. Secondary impairments of musculoskeletal, neurological, cardio-vascular and integumentary systems may also affect the patients with CVA [4, 5].

Shoulder pain is shown to affect around 70% of patients following CVA, and is considered one of the most common impairments which a physiotherapist comes across. Almost 75% of patients complain of pain at some time in the first 12 months following a CVA [6]. The shoulder pain and subsequent reduced participation in rehabilitation hinders recovery while simultaneously affecting functional rehabilitation negatively. Post stroke shoulder pain has been associated with poorer outcomes and increased length of stay in hospital [5, 7]. Even the patients who continues to attend rehabilitation despite the shoulder pain, have tendency to keep the shoulder protected and immobile, which may interfere with performance of self-care, balancing, transfer and ambulation related activities [8, 9].

3 mechanisms are hypothesized to adversely affect the normal shoulder complex mechanics: (a) loss of motor control and the development of abnormal movement patterns, (b) secondary changes to surrounding soft tissue, and (c) glenohumeral joint subluxation [10]. The stability of the shoulder complex is compromised due to these changes and any attempted movement of the upper limb results in inefficient movement patterns or damage to surrounding soft tissue [11]. Yelnik *et al*. (2007) explained that pain and spastic shoulder are frequent in hemiplegic stroke patients, among them shoulder pain is a major problem for these patients, interfering with physiotherapy, sleep and daily activities. It is usually occurring due to local causes like algoneurodystrophy also known as shoulder–hand syndrome, capsulitis, glenohumeral subluxation and also spasticity because of the prolonged muscular contracture and possible tendinopathies [12]. Compromised quality of life (QOL) among patients after CVA with shoulder pain has been described, but it has not been clearly established if it is directly related to the severity of pain; higher degree of shoulder impairment; or other factors such as balance and posture impairment, ambulatory impairments, tone and movement changes etc [13].

Niessen *et al*. (2008) did a study to conclude that painful Shoulder following stroke is a common phenomenon after a cerebrovascular accident, with an estimated incidence of between 16%-84% [14].

Physiotherapy plays a vital role in the management of shoulder pain among hemiplegic patient. In recent decades, some studies have dealt with painful shoulder among the CVA patients in India, but the exact impact of shoulder pain on QOL has not been studied in details in India. This study formulates to fill the gap of knowledge & ideas in this area. The purposes of the study were to assess the impact of shoulder pain and disability on QOL of CVA patients of Surat city in Gujarat state.

Materials and Methods

Study design and population

This study was done using cross sectional survey design by recruitment of CVA patients attending neuro-rehabilitation and physiotherapy centres (i.e. private, hospital based, college based or home based) in Surat city of Gujarat. All the measurements on each person were made at one point in time. Approximately 186 subjects were invited to participate out of which 170 agreed to participate and were recruited for the study.

Inclusion criteria

Both male and female patients between 45-65 years of age having CVA for > 1 week and complain of shoulder pain, and were ready to give informed written consent were included in the study.

Exclusion criteria

Patients who were not willing to participate in the study; were mentally ill; had speech problems or were suffering from serious pathological disease e.g. tumours, tuberculosis, etc. were excluded from the study.

Data collection

Data was collected by using a standard demographic questionnaire along with Shoulder Pain and Disability Index (SPADI) and WHOQOL-BREF (World Health Organization Quality of Life- BREF) Gujarati version after taking approval for usage from WHO [15,16]. The necessary materials like pen, pencil, and white paper, clip board & notebook etc. were used.

After receiving approval from the institutional ethics committee, patients were invited and selected through convenience sampling. Patients were explained about the study and screened for inclusion and exclusion criteria. After that patients who were willing to participate were asked to sign an informed consent form followed by brief evaluation. Patients who had any one of the exclusion criteria were excluded. They were asked the questions given in SPADI and WHOQOL-BREF. The responses were noted and final score were calculated and were considered for statistical analysis.

Results & Discussion

The purposes of the study were to assess the impact of shoulder pain and disability on QOL of CVA patients of Surat city in Gujarat state. Data were numerically coded and analysis of the data was done using an SPSS 20.0.

Sample characteristics

This demographic analysis showed that male subjects n=108 (64%) were predominantly affected by CVA as compare to female n=62 (36%). This result showed that the most affected age group is 51 - 60 (n=63, 37%). As it is seen, almost n=104 (61%) of the CVA subjects were found to be in age group of 41 -60 years. Approximately 50% (n=84) cases was of ischemic pathology affecting the brain. Hemorrhagic type of stroke was found to be affecting 53 (31%) subjects.

Another analysis showed that among all CVA subjects, subject with right side hand dominance were more affect than left side hand dominance. 102 (60%) subjects with right side hand dominance were affected as compared to 68 (40%) left side hand dominance subjects.

The types of setups included for data collection in study were found to be mostly of private clinic type (n=78, 46%). College based OPD (n=53, 31%) was also a major source of data. 23% data collection from hospital based OPD (n=32, 19%) and home care visit (n=7, 4%).

Table 1: Demographic Details of the Sample (n=170)

Variables		Frequency	%
Gender Distribution	Female	62	36%
	Male	108	64%
Age group(years)	45-50	19	11.42%
	51-55	39	22.85%
	56-60	19	24%
	61-65	27	37%
Type of stroke	Haemorrhagic	22	31%
	Ischemic	35	50%
	Non mentioned	13	19%
Dominance	Right	42	60%
	Left	28	40%
Type of setup	Private clinic	32	46%
	Hospital OPD	13	19%
	College OPD	22	31%
	Homecare	3	4%

Table 2: Spadi Domain Scores (n=170)

SPADI Domain Scores	Mean	SD
Pain Score	53.16%	0.27
Disability Score	53.75%	0.27
Total Score	52.89%	0.24

Table 3: Whoqol-Bref Domain Scores (n=170)

QOL Domains	Mean Score	SD
Physical Health	58.29	12.19
Psychological Health	51.13	11.65
Social Relationship	65.59	16.63
Environment	64.57	9.99

Spadi Scores

Table-2 shows values of mean and standard deviation of the SPADI domains. Pain score mean is 53.16% & SD ±0.27 and disability score mean is 53.75% & SD is ± 0.27 and total score mean is 52.89% & SD is ±0.24.

Whoqol Bref Analysis

WHOQOL-BREF has four main domains (i.e. 1- Physical health, 2- Psychological health, 3- Social relationship and 4- Environment). Individual scores were recorded and then were converted into scores out of 100. Mean and SD scores were calculated for each domain. As shown in table 3 mean values and their SDs for domain 1 to 4 were found to be 58.29 ± 12.19, 51.13 ±11.65, 65.59 ±16.63 and 64.57±9.99 respectively.

Correlation between Shoulder Pain and WHOQOL BREF

Correlation between shoulder pain and WHOQOL-BREF are presented in table 4. It is seen that out of 4 domains of QOL, psychological health and social relationship were found to significantly correlated to the pain scores of SPADI at $p<0.05$ and $p<0.01$ levels. The correlation coefficients were found to be -0.262 (p=0.028) and -0.311 (p=0.009) respectively. Similarly, physical health (correlation coefficient=-0.282, p=0.018) and social relationship (correlation coefficient=-0.374, p=0.001) were significantly

correlated with disability scores of SPAD at 0.05 and 0.01 levels.

Total SPADI scores were significantly correlated physical health and social relationship at 0.001 levels with values of correlation coefficients -0.336 (p=0.004) and -0.444 (p=0.000).

Table 4: Pearson Correlation between SPADI Scores and HRQOL-BREF Scores

Whoqol Bref	Physical health		Psychological health		Social relationship		Environment	
SPADI	Pearson Correlation	Significance	Pearson Correlation	Significance	Pearson Correlation	Significance	Pearson Correlation	Significance
Pain score	-0.227	0.059	-0.262	0.028*	-0.311	0.009**	-0.18	0.135
Disability score	-0.282	0.018*	-0.155	0.199	-0.374	0.001**	-0.072	0.554
Total spadi score	-0.336	0.004**	-0.204	0.09	-0.444	0**	-0.189	0.118
*Pain is significant at 0.05 level (2-tailed).					**Pain is significant at 0.01 level (2-tailed).			

Demographic analysis showed that male subjects (n=45, 64%) were predominantly affected by CVA as compared to female (n=25, 36%). It also showed that among all CVA subjects, subjects with right side hand dominance (n=42, 60%) were more affected as compared to left side dominant subjects (n=28, 40%). It was also found that in around 50% cases the CVA was as a result of ischemic pathology affecting the brain. Almost 61% of the CVA subjects were found to be in age group of 41-60 years. A previous hospital based study carried out in India among the 109 patients reported that 61.5% (n=67) were males while 38.5% (n=42) were females. These findings are similar to the findings which were found in previous studied conducted in various countries at different times [9, 13, 16].

The result of this study showed that 61.45% patients had shoulder pain. This study also showed that right shoulder pain is most common in CVA compare to the left side hemiplegic shoulder pain. Right side hand dominance, i.e. 60% (n=42), is more affect than the left side hand dominance, i.e. 40% (n=28). In this study number of participants having shoulder pain is n=43 (61.43%) and disability is n=42 (60%) and total pain and disability is n=40 (57.14%). In studies by Roy *et al*. (1994), Wanklyn *et al*., (1996) and John Chae *et al*., (2007) prevalence of shoulder pain among stroke patients has reported to be in the range of 5 to 84 % [7, 20, 21]. At Lund University Hospital in Sweden, a study was conducted by Jonsson *et al*. (2006) to find out prevalence and intensity of shoulder pain after stroke and showed that 30% participants had constant pain and 68% participants had intermittent pain [22].

Current study measures the impact of shoulder pain and disability by correlating them with the domains of the WHOQOL-BREF. All 4 domains (i.e. psychological health, social relationship, physical health and environmental factor) of the scale were correlated with pain and disability scores. Significant correlation between pain and the psychological, physical and social relationships domain were found. The negative correlation was found suggesting inverse relation between the variables. According to Francisco Javier Carod-Artal *et al*. (2009) quality of life is more affect in stroke patient they concluded that increased risk of shoulder pain in stroke patients with impaired arm motor function [23]. Shoulder pain may restrict patients' daily life after stroke. Another study by Aysegul Barlak *et al*. (2009) study about the affect motor function of the same side of the involvement and impact the quality of life [24].Niessen M *et al* (2008) study proved that affect the daily life activity difficulties in upperlimb dressing, combing, bathing and all other activity [14].

Conclusions

From this study, it was found that 57.14% patients suffer from shoulder pain after stroke in Surat city of Gujarat region. Among these most of them had been suffered from mild to moderate disability associated with shoulder pain (n=42, 60%). As seen by the statistically significant correlations, it can be inferred that shoulder pain impacts psychological health and social relationships in a hemiplegic patient with CVA. Shoulder pain related disability also affects physical health and social relationship in such patients with CVA causing the impact more significant in terms of quality of life.

As physiotherapy plays a vital role in the management of shoulder pain among hemiplegic patient. Findings of this study would be helpful for physiotherapist in working in this area for delivering treatment service. As a result patients become more benefited.

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