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Prevalence of shoulder pain and disability among cerebrovascular accident patients of Surat city in Gujarat state of India

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Abstract
Cerebrovascular accidents (CVA) are a major cause of disability worldwide. Shoulder pain is a common impairment after cerebrovascular accident; and affects patients' participation in rehabilitation; discourages motion; hinders recovery; and adversely affects function, thereby impeding the process of rehabilitation. Results of this study showed that among all cerebrovascular accident 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 cerebrovascular accident was as a result of ischemic pathology affecting the brain. It was found 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.

Keywords: cerebrovascular accident, cerebrovascular stroke, shoulder pain, disability, physiotherapy

Introduction

According to World Health Organization (WHO), cerebrovascular accident (CVA) is a clinical syndrome which consists 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 prevalence of CVA ranges from 200 – 250 per 1, 00,000 population. In rural India estimated prevalence of CVA is 1.1% and in urban India it is approximately 1.9% [3]. Age specific incidence of CVA increase every decade of life estimated to be: 0.1-0.3 cases per 1000 per year for <45 years and 12-20 cases per 1000 per year for 75-84 year [2].

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

As shoulder pain following CVA is shown to affect around 70% of patients, it is considered one of the most common impairments which a physiotherapist comes across. It often appears in the first few days and 75% of patients complain of pain at some time in the first 12 months following a CVA [6]. It affects patients' involvement in rehabilitation and discourages motion of the extremity. The pain and reduced participation in rehabilitation in turn hinders recovery while adversely affecting functional rehabilitation. It has been associated with poorer outcomes and increased length of stay in hospital [5, 7]. The patients who continue 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].

The onset of hemiplegia can adversely affect the normal shoulder complex mechanics through 3 mechanisms including, (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]. These changes compromise the stability of the shoulder complex and any attempted movement of the upper limb can result in inefficient movement patterns or damage to surrounding soft tissue [11]. Reduced quality of life (QOL) among patients after CVA with shoulder pain has been described, but it has not been clearly established if these factors are 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. [12]. 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 [13]. Niessen *et al*. (2008) [14] 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 other countries, but the exact nature and

prevalence of this important health problem 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 prevalence pattern of shoulder pain and associated disability among 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 86 subjects were invited to participate out of which 70 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). 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. The responses were noted and final score were calculated and were considered for statistical analysis.

Results and Discussion

The purposes of the study were to assess the prevalence pattern of shoulder pain and associated disability among 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=45 (64%) were predominantly affected by CVA as compare to female n=25 (36%). They showed that male is more affected than the female with painful hemiplegic shoulder pain.

This result showed that the most affected age group is 51 - 60 (n=25, 37%). Younger age group of 21-30 (n=2, 3%) is less affected as compare to the other age groups. Second most affected age group is above 60 years (n=18, 26%) while age groups 31 -40 (n=7, 10%) and 41-50 years (n=17, 24%) are also significantly affected. As it is seen, almost 61% of the CVA subjects were found to be in age group of 41 -60 years.

Analysis type of brain pathology of stroke showed that among the subjects who participated in the study, approximately 50% cases was of ischemic pathology affecting the brain. Hemorrhagic type of stroke was found to be affecting 22 (31%) subjects. In n=13 (19%) the cause were non-specific or subjects were unaware about the cause or had no documentary evidence for the same at the time of study.Another analysis showed that among all CVA subjects, subject with right side hand dominance were more affect than left side hand dominance. 42 (60%) subjects with right side hand dominance were affected as compared to 28 (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=32, 46%). College based OPD (n=22, 31%) was also a major source of data. Almost 77% data collection of data was done from private clinic and college OPD and 23% data collection from hospital based OPD (n=13, 19%) and home care visit (n=3, 4%).

Table 1: Demographic Details of the Sample (n=70)

Variables		Frequency	%
Gender Distribution	Female	25	36%
	Male	45	64%
Age group(years)	45-50	8	11.42%
	51-55	16	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%

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.

Table 2: SPADI Domain Scores (n=70)

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

Prevalence of Shoulder Pain

In this study 70 subject were selected. We considered subjects with >50% scores in shoulder pain, disability and total SPADI scores as positive findings. As seen in table 3, 40 (57.14%) subjects reported significant shoulder pain (SPADI score >50%) and 42 (60%) subjects had a disability (SPADI score >50%). Total scores of 43 (61.43%) subjects were found in significant range to be considered as prevalent.

Table 3: Prevalence of Shoulder Pain and Disability Index

SPADI Domain	Frequency (No. of subjects)	Prevalence (%)
Pain	40	57.14
Disability	42	60
Total	43	61.43

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).

In this study, it was found that most patients had intermittent shoulder pain. Joy *et al*. (2012) [17] stated that frequency of shoulder pain among stroke patient's rises exponentially with increasing ages (17). Few other studies also found that the risk of shoulder pain is increased with age which is in agreement with the findings of this study. In this study, more male subjects were found to be suffering from shoulder pain is n=45(64%) as compared to female, i.e. n=28(36%). English *et al*. (2008) [18] in their study conducted among stroke patients of Australia stated that majority of participants who had shoulder pain were male 41 (60.3%) and only 27 (39.7%) were female (18).

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). According to Ingrid Lindgren *et al.* (2007) stated that right side shoulder pain is more affect than the left side (19).

Analysis showed that most of the data was collected from the private clinic. As compared to hospital OPD, SPB Physiotherapy College OPD and some are collected from home care. Most of data were collected from private clinics (n=32, 46%) because they gave to permission for data collection.

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) [20], Wanklyn *et al*., (1996) [21] 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).

As per any research, current study is also having its limitations. The sample size is small and it consists of unequal gender, age and patho-physiological distribution of patients. That is why to generalize the results the study may be replicated with large, all inclusive and representative sample, or with a control group is done in future.

Conclusions

Hemiplegic shoulder pain is a major problem in CVA patients. 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%). This study fills the gap of knowledge & ideas in this the areas of prevalence and distribution of shoulder pain among CVA patients. Beside this, it helps to discover the lacking area of a care, especially before doing any activities.

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 and as a result patients become more benefited.

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