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# Techniques Used for Chest Physiotherapy for Stroke Patients Admitted in Neurology Departments of Tertiary Care Hospitals of Khyber Pakhtunkhwa: A Cross Sectional Survey

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**Abstract**
Cerebrovascular accident (CVA) or Stroke occurs due to the insufficiency or disruption of blood to the brain through blood vessels. Patients with CVA classically show changes in the patterns of breathing reduced ventilator functions, diminished strength of the pulmonary muscles and declined activity of the impaired diaphragm which will cause respiratory infections. Chest physiotherapy is one of the best physical sets of treatments that lead to enhance the pulmonary functions, prevent pulmonary infections and is to help patients breathe more freely and get more oxygen to the body. The objective of this study is to evaluate the current chest physiotherapy techniques used for stroke patients admitted in neurological departments of the public and private tertiary health care sectors of KP. A Census was conducted including all physical therapists working in the Tertiary Care Hospitals of Khyber Pakhtunkhwa. A Self-administered questionnaire adopted from a published research paper was used for data collection and that data was analyzed through SPSS version 25. Chest physiotherapy techniques which were most commonly used for the stroke patients were postural drainage (92%), chest wall percussion 86%, chest wall vibration and active cycle of breathing Techniques were used by 71% of the physical therapists working in the tertiary care hospital of KP. The most commonly used chest physiotherapy techniques used by the physical therapist working in the tertiary care hospitals of Khyber Pakhtunkhwa were conventional chest physiotherapy techniques (postural drainage, percussion, vibration) and modern techniques (ACBT).

## INTRODUCTION

Cerebrovascular accident (CVA) or Stroke occurs due to the insufficient or disruption of blood to the brain through blood vessels[1]. There are 4 stages of brain stroke which are: Stage 1 is the asymptomatic light stage of stroke which is not common and mostly caused by arteriosclerosis. Stage 2 is the transient ischemic attack (TIA) which persists for less than twenty-four hours with manifestations of diplopia, vertigo and headache but the neurological deficit from ischemia may last up to a week. Stage 1 and stage 2 both are reversible. Stage 3 is the progressive stroke whose symptoms are the same as that of stage 2 but are intense and for more than 24 hours. Stage 4 is the fully developed stroke due to blood disruption or with necrotic cells[2]. Every year the worldwide prevalence of CVA is almost1.5 core in which 2/3 lead to everlasting disability or demise. Stroke is a common disorder with terrible consequences for the patient and for society and in the upcoming years there will be a rise in the stroke prevalence[3]. In the year 2011, stroke was considered to be the 2nd most common death causing, totaling for a death toll to 6.2 million (11% of all deaths)[4]. The factors causing stroke vary with the age group and the probability of stroke rises with aging mostly from above 30 years. Age is one of the chief possible factors for stroke to be developed, CVA mostly affects the individuals aged 45 and people with age above 65 are 95% more at risk of developing stroke. Next to heart problems and cancer, the third chief cause of death is CVA. In the United States of America (US) disability is typically caused due to stroke and comes on third number of diseases causing death. Male gender is 25% more prone to have strokes than the female gender. Females live for an increased life span in comparison to males after stroke thus the death rate of females is 60%[5]. Previous studies have proved that CVA not solely acts on the muscles of lower and upper limb but the muscles of the pulmonary system too are affected[6]. Prevention of Chest infections are very important otherwise it will raise the risk of death up to 3 times in the 1 month after stroke and will also longer the hospital stay for stroke patients[7].

Stroke affects the normal functions of the lungs and hence the pulmonary complication is more common after stroke. A patient who has got stroke has significantly decreased peak expiratory flow (PEF) values, forced vital capacity ( FVC), forced expiratory volume (FEV1) and excursion of the chest as compared with a normal person, this is because of the weakness of respiratory muscles after stroke. Chest physiotherapy is one of the best physically set of treatments that lead to enhance the pulmonary efficacy, strength of pulmonary muscles, promote expansion of lungs and drain secretions from the pulmonary tract to prevent the aspiration pneumonia. The goal of chest physiotherapy is mainly to assist the patients to breathe easily so the body gets more oxygen[1].

## MATERIALS AND METHODS

On the approval of the presented research proposal by the ethical review board and advanced studies and research board (ASRB) of Khyber Medical University Peshawar, the required data was collected from the selected Physical Therapists fulfilling the inclusion criteria. Before the data collection, permission was taken from the respective hospitals and information sheet was provided to the participants. A Census was conducted including all physical therapists working in the Tertiary Care Hospitals of Khyber Pakhtunkhwa. A Self-administered questionnaire adopted from a published research paper was used for data collection and that data was analyzed through SPSS version 25.

## RESULTS AND DISCUSSIONS

This study Out of total 76 participants 52 (68.4%) were male and 24 (31.6%) were females and out of total 76 participants 70 (92.1%) have applied postural drainage technique whereas 6 (7.9%) have not applied this technique. Chest physiotherapy techniques which were most commonly used for the stroke patients were postural drainage (92%), chest wall percussion 86%, chest wall vibration and active cycle of breathing Techniques were used by 71% of the physical therapists working in the tertiary care hospital of KP.

1 GENDER OF THE RESEARCH PARTICIPANTS: The below table 1 shows the gender of the physical therapists working in the tertiary care hospitals of kp. Out of total 76 participants 52 (68.4%) were male and 24 (31.6%) were females.

**Different Chest Physiotherapy Techniques Used by Physical Therapists:** The below multiple response Table 2 shows that majority of the Physical therapists have use Postural Drainage Technique followed by chest Wall Percussion Technique and Chest Wall Vibration Technique as well as Active cycle of breathing technique (ACBT).

The main objective of the study was to evaluate the current chest physiotherapy techniques used for stroke patients admitted in Neurological Departments of Government and Non-Government tertiary health care sectors of Khyber pauthonkhwa (KP). For this purpose we took data from the tertiary care hospitals of Khyber pauthonkhwa in which majority of data was taken from LRH followed by HMC. According to our findings out of total 76 physical therapists 52 (68.4%) were male and 24 (31.6%) were females. Furthermore majority of the physical therapists were MSPT (72.4%).In the current research study the physical therapists working in the tertiary care hospitals of the

**Table 1: Classification of chest physiotherapy**

| A. Conventional | B. Instrumental | C. Modern |
|---|---|---|
| Postural drainage technique | Positive expiratory pressure (PEP) | Active cycle of breathing technique.( ACBT) |
| Percussion /cupping | Continuous positive airway pressure (CPAP) | Autogenic drainage |
| Vibration | High frequency chest wall oscillations (HFCWO) | |
| Forced expiratory technique ( FET) | Intrapulmonary percussive ventilation ( IPV) | |

**Table 2: Gender of the Research Participants**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Female | 24 | 31.6 | 31.6 | 31.6 |
| Male | 52 | 68.4 | 68.4 | 100.0 |
| Total | 76 | 100.0 | 100.0 | |

**Table 3: Multiple response table of chest physiotherapy**

| Chest Physiotherapy Techniques | Responses | | |
|---|---|---|---|
| | N | Percent | Percent of Cases |
| Postural Drainage | 70 | 18.0 | 92.1 |
| Chest Wall Percussion | 66 | 17.0 | 86.8 |
| Chest Wall Vibration | 54 | 13.9 | 71.1 |
| Forced expiratory Technique | 29 | 7.5 | 38.2 |
| Autogenic Drainage | 18 | 4.6 | 23.7 |
| Active Cycle Of Breathing Technique | 54 | 13.9 | 71.1 |
| Positive Expiratory Pressure | 30 | 7.7 | 39.5 |
| Continuous Positive Airway Pressure | 21 | 5.4 | 27.6 |
| High Frequency Chest Wall Oscillation | 24 | 6.2 | 31.6 |
| Intrapulmonary Percussive Ventilation | 21 | 5.4 | 27.6 |
| Other than above techniques | 2 | 0.5 | 2.6 |
| Total | 389 | 100.0 | 511.8 |

kp were not only using a single chest physiotherapy techniques but using different for different patients and may also using the combination of any two for the better response.

The physical therapists included in our current research survey was used the conventional ,modern and instrumental techniques for chest physiotherapy of the admitted stroke patients in the neurological department of their respective hospitals but our results revealed that most of the physical therapists working the tertiary care hospitals of KP using conventional chest physiotherapy techniques(postural drainage, percussion, vibration) and modern technique(ACBT) while very little proportional of physical therapists was using instrumental chest physiotherapy techniques as compared to conventional and modern chest physiotherapy techniques .

Coughing alone was equally beneficial as postural drainage plus percussion and vibration (PDPV) in sputum expectoration, according to DeBoeck and Zinman in 1984[8].

Percussion on the chest wall can be quick or slow, single-handed or double-handed. In a small carefully controlled group crossover trial, adding all types of chest percussion in random order to postural drainage and the FET significantly improved the rate, but not the volume of sputum secretion in patients with excessive sputum production, vs. in patients with no percussion. Fast double-handed percussion had the most effect, while slow single-handed percussion had the least. Because the study was small, the population was diverse and only a single therapist used all of the strategies, so the findings should be evaluated carefully. One more small mixed population study discovered that chest wall percussion combined with postural drainage and deep breathing exercises increased dry sputum weight expectancy substantially more than just postural drainage. The combination of chest percussion and postural drainage combined with tidal breathing was not as effective. When combined with postural drainage, chest wall percussion had no negative effects on oxygen saturation, heart rate, or pulmonary function[9].

## CONCLUSION

The Physical therapists working in the tertiary care hospitals of Khyber Pakhtunkhwa using different chest physiotherapy techniques for the chest physiotherapy of the admitted stroke patients. The physical therapists working in the tertiary care hospitals of kp not using a single CPT but using different techniques for different patients, but some time using the combination of chest physiotherapy techniques for the best outcomes .But in our study most of the physical therapist uses conventional (which include postural drainage, percussion, vibration and FET) and modern chest physiotherapy techniques (which include ACBT and autogenic drainage) and very less physical therapists those who are working in public and private tertiary care hospitals of KP uses instrumental CPT which include PEP, CPAP, HCWO and IVP.

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