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ORIGINAL ARTICLE

Comparison of Postural Drainage and Percussion Techniques in Cystic Fibrosis Patients

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ABSTRACT

Aim: To determine the effects of postural drainage and percussion techniques in patients with cystic fibrosis.
Methods: This research was carried out in the 'South Punjab Clinics, Hospital Multan' as a randomized clinical trial. From December 2020 to June 2021, the research was completed in about six months. This study used a sample size of 32 cystic fibrosis patients to determine the effects of postural drainage and percussion treatments. Two groups of patients were formed. Suctioning and aerosol medicines were used as a common treatment for both groups. Postural drainage, aerosol drugs, and suctioning were used in Group A, while the percussion method, aerosol medications, and suctioning were used in Group B. The frequency of sputum, forced spirometry FEV1 and patient satisfaction are also used.
Results: The mean age and standard deviation of 32 patients was 281.009, including 20 males and 12 females. The pretreatment mean value of forced expiratory volume (FEV1) for the percussion and postural drainage groups was 4.25 and 2.38, and the post-treatment mean value was 1.00 and 2.22 respectively. The pretreatment mean value of sputum production for the percussion and postural drainage groups was 1.00 and 1.00, and the post treatment mean value was 2.25 and 2.19 respectively. Data was not normally distributed, so a non-parametric test (Mann-Whitney) was applied. The calculated p value was greater than 0.05.
Conclusion: In cystic fibrosis patients, there was no substantial difference in the benefits of percussion and postural draining techniques.
Keywords: Cystic fibrosis, percussion, postural drainage, airway clearance technique,

INTRODUCTION

Cystic fibrosis (CF) is an inherited genetic disorder. Its characteristics include pulmonary, digestive system and exocrine gland problems. Patients with cystic fibrosis have thick and viscid secretions of mucus that cause obstruction of airways and cause chronic type of progressive infection, inflammation, and gradual damage of the airways[1].

The pathophysiologic events of CF begin early in life with abnormal fluid on the surface of airways, which in result impaired mucociliary clearance and following the obstruction in small airways by mucus. Chronic infection in airways and an increased inflammatory response further obstruct the airways by bacteria and with cellular debris from the lysis of large numbers of neutrophils increased viscosity and adherence secretions in the airways by the rapid breakdown of these cells including neutrophil-derived deoxyribonucleic acid and filamentous actin[2] with symptoms like tiredness, salty skin, cough and sputum persistently, breathlessness, wheezing, pulmonary infection, loss in weight poor in growth, bowel movements difficulty within the first 24/48 hours of life.

Chest physiotherapy is very important part of clinical management for elimination of airway secretions and various types of conventional chest physiotherapy techniques are used for clinical management of CF. This include conventional chest physiotherapy (CCPT), PEP (Positive expiratory pressure) mask therapy, HPEP (High pressure PEP) mask therapy, ACBT (Active cycle of breathing techniques, AD (Autogenic drainage), AOD (Airway oscillating devices), MP (Mechanical percussive devices) and HFCC (external high frequency chest compression devices)

Pulmonary therapies in daily for cystic fibrosis are very essential in airway secretions clearing and slowing the lung function decline. These therapies include inhaled medications, antibiotics and airway clearance techniques[2]. Cough, suctioning and other techniques to clear their airways from thick sputum, become necessary for these individual. The most essential technique in the therapy of cystic fibrotic airway illness has always been Airway Clearing Therapies. Among these airway clearance techniques, conventional chest physiotherapies have major role in clearing the airways from thick sputum. These techniques include postural drainage, percussion, chest shaking, direct cough or puffing and huffing. Both postural drainage and percussion techniques have major role in elimination of secretions or sputum and are used in combination or separately. So it is very important to find out either which of the treatment option is more effective in patient with cystic fibrosis in terms of improving treatment quality and pattern for giving patients the best treatment[3,4].

According to researcher's best knowledge, there was insufficient literature in comparison to assess the effectiveness of postural drainage and percussion methods in cystic fibrosis patients.

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As a result, the researcher sought to undertake this study in order to improve patient care and save energy and money for the benefit of the community.

MATERIALS AND METHODS

This research was carried out in the South Punjab Clinics, Hospital Multan as a randomized clinical trial with simple random sampling technique. After permission from Institutional Review Board the research was completed in about six months from December 2020 to June 2021, this study used a sample size of 32 cystic fibrosis patients to determine the effects of postural drainage and percussion treatments. Patients with cystic fibrosis who were diagnosed and receiving traditional chest physiotherapy procedures such as percussion and postural drainage were included, as were patients with systemic illnesses, inflammatory diseases, various airway clearing approaches and other musculoskeletal problems. Two groups of patients were formed. Suctioning and aerosol medicines were used as a common treatment for both groups. Postural drainage, aerosol drugs, and suctioning were used in Group A, while the percussion method, aerosol medications and suctioning were used in Group B. The airway clearing technique questionnaire was used as a study tool. Data analysis was done by SPSS-22.

RESULTS

The data was not normally distributed. The calculated P value was greater than the reference which denotes there is no significant change while application of both techniques for clearance of lungs. The mean age and standard deviation was 27±1.054 years. There were 20(62.5%) males and 12(37.5%) female patients.

Table 1:

Groups	Age of patients			Total
	18-25 years	26-35 years	36-45 years	
Percussion method	3	8	5	16
Postural drainage method	5	6	5	16
Total	8	14	10	32

Mean age±SD: 27±1.054

Table 2:

	Forced spirometry which include FEV1 (Pre-Rx)	Forced spirometry which include FEV1 (Post-Rx)	Sputum Production pre-treatment?	Sputum Production post-treatment?	Do you feel your CCCPT is effective?
Mann-Whitney U	112.500	108.000	128.000	126.500	112.000
Wilcoxon W	248.500	244.000	264.000	262.500	248.000
Z	-.635	-.823	.000	-.062	-1.052
Asymp. Sig. (2-tailed)	.525	.410	1.000	.951	.293
Exact Sig. [2*(1-tailed Sig.)]	.564[b]	.468[b]	1.000[b]	.956[b]	.564[b]

DISCUSSION

This review's data is of varying quality, but it shows that all of the procedures and technologies mentioned might be useful in the therapeutic treatment of patients with CF. When comparing the effects of PEP with other airway clearing methods on lung function and patient preference, it was discovered that there was high-quality evidence that indicated a substantial reduction in pulmonary exacerbations[5].

Airway clearance techniques are routinely used as part of physiotherapy management of individuals experiencing an acute exacerbation of bronchiectasis, according to a survey, and that the choice of technique and perceived effectiveness varies depending on the patient's age, as there is no difference between these two techniques in the current stud[6].

The goal of this study was to compare the efficacy of three different techniques: Postural Drainage and Percussion (PD&P), IPV (intrapulmonary percussive ventilation) and HFCWC (high-frequency chest wall compression). IPV moist sputum had significantly higher weights than HFCWC (p 0.05). The weights of medium dry sputum did not differ much. None of the three approaches were preferred over the others in terms of general preference and preference subcomponents[7].

Autogenic drainage (AD), an ACT (airways clearance method), was thought to be just as effective as postural drainage with percussion in the treatment of people with CF (PD). Patients with cystic fibrosis, on the other hand, demonstrated a strong preference for the AD approach. Both AD and PD are successful physiotherapy treatments for CF patients, according to the findings, and both strategies offer advantages[8].

In 2020, researchers conducted a study called "Oscillatory airway clearing devices for cystic fibrosis" Researchers uncovered no convincing evidence that vibrating devices are better or superior to other forms of physiotherapeutic devices. Vibrational devices were utilized more commonly than positive exhalatory pressure in one research to use other medications for a chest infection. When prescribing the optimal approach for clearing airways, physiotherapists should consider the requirements of the patients they treat. Long-term studies are required to count and record an increasing number of people[9].

Duration of the study should be more than 6 months to maintain the follow-up and multicenter.

CONCLUSION

In cystic fibrosis patients, there was no substantial difference in the benefits of percussion and postural draining techniques.

Conflict of interest: Nil

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