Original Article

Effects of postural drainage physical therapy techniques on management of pneumonia

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Objectives
To compare the hospital stay of patients with pneumonia, with and without postural drainage physical therapy technique and to measure the amount of sputum produced before and after physical therapy.

Patients and Methods
This randomized control trial was carried out at Department of Medicine and Gynecology District Headquarter Hospital (DHQ), Abottabad, and Department of Medicine and Department of Physical Therapy and Rehabilitation Islamic International Medical College Trust (IIMCT), Pakistan Railways Hospital, Rawalpindi, from January 2011 to January 2012. A sample of 87 was randomly placed into two groups; Group A included 45 patient, 24 female and 21 male with age range of 20-60 (average 36 years). The physical therapy management of group A was chest mobilization techniques twice a day. The group B included 42 patients, 25 female and 18 male with age range of 21-62 (average 36 years). The physical therapy management in group B included postural drainage in different positions with chest mobilization techniques twice a day. The techniques outcomes were assessed by hospitalization stay and a three point patient's self reporting scale for amount of sputum. The data was analyzed through SPSS and the p-value was calculated for both the group by t-test for the amount of sputum before the application of techniques and after the application of technique.

Results
The average hospitalization stay of group A was 7 days and in group B it was 5 days. The amount of sputum was significantly decreased in Group B as compared to group A ($p<0.003$).

Conclusion
The postural drainage combined with chest mobilization techniques are more effective than the chest mobilization techniques alone. The postural drainage physical therapy techniques are also efficacious in reducing the amount of sputum in patients with pneumonia combined with other techniques. (Rawal Med J 2012;37:250-252).

Key words
Pneumonia, postural drainage, chest mobilization techniques.

INTRODUCTION

Pneumonia is a common inflammatory pulmonary condition that affects the alveoli, responsible for the gaseous exchange in the lungs. It is commonly associated with the fever, chest symptoms and consolidation on chest x-rays.[1,2] Many infectious agents like bacteria, viruses, fungi and parasites can be causative agents.[3] The common diagnostic tools are x-rays and sputum examination.[4] The duration of illness can last two to four weeks.[5] The typical management is antibiotics, analgesics, rest and fluid intake with chest physiotherapy.[6]

A variety of physical therapy techniques are used to manage the chest complication in these patients and include deep breathing exercises, chest mobilization techniques, vibration, percussion, bilateral compression, postural drainage techniques and strengthening of the respiratory muscles.[7] The principle of postural drainage techniques is to bring different lobes in antigravity positions which assist to bring the secretion out from the lungs and decrease the chest congestion. The different postural drainage positions are maintained with the help of pillows and blankets for 5-15 minutes and during these positions the different chest mobilization techniques vibration, percussion and compression are applied to loosen the secretions.8 The aim of our study was to compare the hospital stay of patients with pneumonia, with and without postural drainage technique and to measure the

amount of sputum produced before and after therapy.

PATIENTS AND METHODS

A sample of 87 admitted patients was selected from the Department of Medicine and Gynecology DHQ Hospital, Abottabad, and Department of Medicine and Department of Physical Therapy and rehabilitation IIMCT Pakistan Railways Hospital Rawalpindi, Pakistan. All the patients were randomly placed into two groups; in group A 45 patient were included, 24 female and 21 male with age 20-60 (average 36 years). The physical therapy management of group A was chest mobilization techniques twice a day. The group B included 42 patients, 25 female and 18 male with age 21-62 (average 36 years). The physical therapy of group B included postural drainage in different positions with chest mobilization techniques twice a day.

Table 1. Different postural drainage positions according to specific lobes.

lobes	Segments	Postural drainage positions
Upper Lobes	Anterior Apical- LUL	Supine lying, head and shoulders elevated at 45 degree or 18 up to inches from horizontal
	Posterior Apical- RUL&LUL	Erect sitting with hip and knees flexed at 90 degree
	Anterior- RUL&LUL	Supine lying
	Posterior-LUL	Side lying, rest on Rt side, head and shoulder raised at 45 degree or 18 up to inches from horizontal, supported on pillows
	Posterior-RUL	Side lying, rest on Lt side, supported on pillows
	Lingular-LUL	Side lying, rest on Rt side, legs elevated 12 up to inches from horizontal
	Lingular-LUL	Side lying, rest on Lt side, legs elevated 12 up to inches from horizontal
Lower Lobes	Anterior Basal-LLL&RLL	Supine, pillow under the knees, foot & knees elevated 18-20 inches from the horizontal
	Posterior Basal- LLL&RLL	Prone , pillow under the knees, foot & knees elevated 18-20 inches from the horizontal
	Anterior Lateral- LLL&RLL	Side lying on the Rt, pillow under the waist keep spine straight and foot & knees elevated 18-20 inches from the horizontal
	Posterior Lateral- posterior- LLL&RL	Side lying on the Lt, pillow under the waist keep spine straight and foot & knees elevated 18-20 inches from the horizontal
	Superior-LLL&RL	Prone pillow under the abdomen to flatten the back

LLL, Left Lower lob; RUL, Right Lower Lobe; LUL, Left upper lobe; RLL, right lower lobe; RML, right middle lobe; (from white, GC. Basic Clinical Competencies for respiratory Care: An Integrated Approach. Albany, NY, Delmar Publisher 1988

The postural drainage positions were selected as per the involved lobes (Table 1). The techniques outcomes were assessed by hospital stay and a three point patient's self reporting scale for amount of sputum. The average of hospital stay was recorded for both groups and the important statistical aspects of the study are summarized in Table 2. The data was analyzed through SPSS and the p-value was

calculated for both the group by t-test for the amount of sputum before the application of techniques and after the application of technique for both group A and B.

RESULTS

The average hospital stay of group A was 7 days and of group B was 5 days. The amount of sputum was significantly decreased in Group B as compared to group A ($p<0.003$).

Table 2. Summary of the study.

Variables	Group A	Group B
Sample size	45	42
Male	21	18
Female	24	25
Age range	20-60 years	21-62 years
Average age	36.37 years	36.5 years
Average hospitalization stay	7days	5days

DISCUSSION

The postural drainage is an effective part of chest physical therapy in the management of pneumonia and others chest conditions. The efficacy of postural drainage has been shown by many studies in COPD and cystic fibrosis. Using forced expiration technique as an adjunct to postural drainage in treatment of cystic fibrosis, it was shown that postural drainage was an effective part of patient's management for cystic fibrosis.[8]

Varekojis SM et al conducted a comparative study on the therapeutic effectiveness of and preference for postural drainage and percussion, intrapulmonary percussive ventilation, and high-frequency chest wall compression in hospitalized cystic fibrosis patients and they showed that postural drainage was one of the effective air way and chest clearance techniques.[9]

Rossman CM et al in a study on effect of chest physiotherapy on the removal of mucus in patients with cystic fibrosis reported that the postural drainage with percussion was statistically more significant as compared to spontaneous cough techniques applied at rest.[10]

CONCLUSION

The postural drainage combined with chest mobilization techniques was more effective than the chest mobilization techniques alone. It improved the in-patient management of pneumonia and decreased the hospitalization stay and amount of sputum production.

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