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Original article

Preoperative Pulmonary Rehabilitation Versus Chest Physical Therapy in Patients Undergoing Lung Cancer Resection: A Pilot Randomized Controlled Trial

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Abstract

Objective

To evaluate the effect of 4 weeks of pulmonary rehabilitation (PR) versus chest physical therapy (CPT) on the preoperative functional capacity and postoperative respiratory morbidity of patients undergoing lung cancer resection.

Design

Randomized single-blinded study.

Setting

A teaching hospital.

Participants

Patients undergoing lung cancer resection (N=24).

Interventions

Patients were randomly assigned to receive PR (strength and endurance training) versus CPT (breathing exercises for lung expansion). Both groups received educational classes.

Main Outcome Measures

Functional parameters assessed before and after 4 weeks of PR or CPT (phase 1), and pulmonary complications assessed after lung cancer resection (phase 2).

Results

Twelve patients were randomly assigned to the PR arm and 12 to the CPT arm. Three patients in the CPT arm were not submitted to lung resection because of inoperable cancer. During phase 1 evaluation, most functional parameters in the PR group improved from baseline to 1 month: forced vital capacity (FVC) (1.47L [1.27â€“2.33L] vs 1.71L [1.65â€“2.80L], respectively; $P=.02$); percentage of predicted FVC (FVC%; 62.5% [49%â€“71%] vs 76% [65%â€“79.7%], respectively; $P<.05$); 6-minute walk test (425.5 $\hat{\pm}$ 85.3m vs 475 $\hat{\pm}$ 86.5m, respectively; $P<.05$); maximal inspiratory pressure (90 $\hat{\pm}$ 45.9cmH₂O vs 117.5 $\hat{\pm}$ 36.5cmH₂O, respectively; $P<.05$); and maximal expiratory pressure (79.7 $\hat{\pm}$ 17.1cmH₂O vs 92.9 $\hat{\pm}$ 21.4cmH₂O, respectively; $P<.05$). During phase 2 evaluation, the PR group had a lower incidence of postoperative respiratory morbidity ($P=.01$), a shorter length of postoperative stay (12.2 $\hat{\pm}$ 3.6d vs 7.8 $\hat{\pm}$ 4.8d, respectively; $P=.04$), and required a chest tube for fewer days (7.4 $\hat{\pm}$ 2.6d vs 4.5 $\hat{\pm}$ 2.9d, respectively; $P=.03$) compared with the CPT arm.

Conclusions

These findings suggest that 4 weeks of PR before lung cancer resection improves preoperative functional capacity and decreases the postoperative respiratory morbidity.



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Keywords

Lung cancer; Postoperative complications; Rehabilitation; Thoracic surgery

List of abbreviations

COPD, chronic obstructive pulmonary disease; CPT, chest physical therapy; IMT, inspiratory muscle training; MEP, maximal expiratory pressure; MIP, maximal inspiratory pressure; PPC, postoperative pulmonary complication; PR, pulmonary rehabilitation; 6MWT, 6-minute walk test

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