Pulmonary Rehabilitation in Clinical Setting – Own Experience

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Abstract
The author states Pulmonary Rehabilitation in following order in this paper; 1. Overview of Pulmonary Rehabilitation, 2. Knowledge and Awareness of Pulmonary Rehabilitation, 3. Payer Awareness, 4. Pulmonary Rehabilitation in other diseases than COPD, 5. Comorbidities and physical activity, 6. Technology-assisted exercise training. 7. Cost-effectiveness of pulmonary rehabilitation programs.

1. Overview of Pulmonary Rehabilitation
Pulmonary rehabilitation (PR) has demonstrated physiological, symptom reducing, psychosocial, and health economic benefits in patients with chronic respiratory diseases. It should be a standard of care for patients with a chronic respiratory disease. Nowadays it is not included in the integrated care of patients with chronic respiratory disorders. Actual delivery of PR services is insufficient and limited for many reasons: insufficient funding, limited resources for PR, lack of healthcare professional, low payer, patients awareness and lack of knowledge regarding benefits of PR. Benefits of PR rehabilitation are well known and recount in the statement of with EBM extensive references. PR reduced hospitalization, reduced unscheduled healthcare visits, improved exercise capacity, reduced symptoms of dyspnea and leg discomfort, improved limb muscle strength and endurance, improved health-related quality of life, improved functional capacity (e.g., activities of daily living), improved emotional function, enhanced self-efficacy and knowledge, enhanced collaborative self-management, potential for increased daily physical activity levels.

2. Knowledge and Awareness of Pulmonary Rehabilitation
Patients will not receive PR unless they are referred, which is unlikely to occur unless healthcare professionals are aware of the existence of PR and have knowledge of its professional awareness of PR is currently a barrier to patient referral. Lack or insufficient health care professional awareness of Pulmonary Rehabilitation is currently a barrier to patients referral. Currently indications and benefits of PR are generally not a mandatory part of the education of physicians or allied healthcare professionals. There is a clear need for enhanced and more standardized exposure to PR within existing healthcare professionals’ training programs. There is a need for more education and learning opportunities for care physicians, nurse practitioners, physician associates, and other allied healthcare professionals about the process and benefits of PR. Increased knowledge of PR could foster dialogue between healthcare professionals and their patients, thereby promoting referrals to PR.

3. Payer Awareness
Pulmonary rehabilitation is one of the most cost-effective treatment interventions available for patients with chronic respiratory diseases and is associated with a substantial reduction in hospitalizations, other urgent healthcare resource use, and health care costs. Nevertheless, payer awareness of PR is often poor, and funding of PR is inadequate. Although heterogeneous payment structures and resources exist within and across countries, increasing payer knowledge is the first step toward securing adequate long-term funding. Healthcare professionals and patient advocacy groups should develop and disseminate information on the costs and cost-effectiveness of PR to payers. The process and outcomes of PR should be made more transparent to payers by PR service providers. Healthcare professionals should investigate the cost-effectiveness of PR in countries wherein this information is lacking and develop methods of detailing the benefits, costs, and value of PR to be communicated to payers.

4. Pulmonary Rehabilitation in other diseases than COPD
Most individuals enrolled in pulmonary rehabilitation have COPD. However, individuals with chronic respiratory disorders other than COPD experience similar symptom burden and activity limitation. In the past few years there have been a number
of randomized controlled trials and uncontrolled trials investigating the effects of pulmonary rehabilitation in people with chronic respiratory disorders other than COPD. Exercise intolerance is a key feature of the interstitial lung diseases (ILD), and is often associated with marked dyspnea on exertion. Poor exercise tolerance is associated with reduced quality of life and poor survival. Exercise limitation in ILD is related to altered respiratory mechanics, impaired gas exchange, and circulatory limitation. Peripheral muscle dysfunction is also emerging as an important contributor to exercise limitation. It is likely that physical deconditioning plays a similar role in ILD as it does in other chronic respiratory diseases, with avoidance of activities that provoke dyspnea and fatigue and reduction in physical activity. Emerging evidence suggests that pulmonary rehabilitation may result in meaningful short-term benefits in patients with ILD. Although the mechanisms of respiratory limitation in COPD and ILD differ, the similarities in clinical problems (exercise intolerance, muscle dysfunction, dyspnea, impaired quality of life) suggest that pulmonary rehabilitation may also benefit these patients.

Pulmonary rehabilitation plays an essential role in the management of individuals both before and after lung transplantation. Pretransplant pulmonary rehabilitation can help individuals to optimize and maintain their functional status before surgery. As impaired exercise capacity is an important predictor of thoracic surgery outcomes and survival, increased exercise tolerance achieved in pulmonary rehabilitation has the potential to improve surgical outcomes. The exercise training regimen used depends in part on the underlying disease for which the patient is undergoing transplantation. In general, individuals have severe exercise limitation and gas exchange disturbances, and may require low-intensity exercise or interval training. Individuals continue the exercise achieved in pulmonary rehabilitation up to the time of surgery. Close partnering and communication between the patient, referring care provider, and pulmonary rehabilitation staff is crucial, to identify potential problems and to enable adaptation of the individual’s medical therapy and/or exercise prescription if the patient’s condition changes. The education component covers the risks and benefits of surgery, topics related to care in the postoperative period (controlled coughing, chest tubes, wound care, secretion clearance techniques, etc.), risks and benefits of immunosuppressive agents, and planning for the required follow-up visits and testing. Gloeckl and colleagues studied the effect of interval training versus continuous training in lung transplant candidates with COPD. Interval training was associated with a lower dyspnea sensation during exercise and fewer unintended breaks, but achieved similar improvements in exercise capacity compared with continuous training. Preliminary results from Jastrzebski and co. suggest that Nordic walking is also safe, feasible, and effective in patients with end-stage lung disease referred for lung transplantation. In the last studies positive outcomes of pulmonary rehabilitation were observed in areas of maximal and functional exercise capacity, skeletal muscle function, and lumbar bone mineral density.

Deconditioning, muscle weakness, fatigue, cachexia, and anxiety and concurrent COPD frequently result in disability among individuals with lung cancer. Dyspnoea and depressed mood also contribute to impaired quality of life (298). Physical inactivity may be an underlying cause. Therefore, these processes can be improved after pulmonary rehabilitation. Exercise training improves strength, well-being, and health status among individuals with lung cancer who are undergoing chemotherapy as well as exercise endurance, cycling work performance, fatigue, and quality of life of individuals with lung cancer who have undergone treatment. Individuals with stage IIIb and stage IV non–small cell lung cancer undergoing medical therapy and who are able to complete 8 weeks of rehabilitation achieve reduction in symptoms with maintenance of walking endurance and muscle strength; however, many are unable to complete the program. Multimodality chest physiotherapy with breathing exercises may also help to control symptoms. Low exercise tolerance is associated with poor thoracic surgical outcomes and reduced survival among individuals with lung disease. Preoperative pulmonary rehabilitation can optimize individuals’ exercise tolerance and overall medical stability before lung cancer resection surgery. Improvement in exercise performance may also render a patient initially considered inoperable to become a candidate for potentially curative surgery. The duration of preoperative rehabilitation for individuals with lung cancer must be dictated by medical necessity. A short duration (2–4 wk) of preoperative pulmonary rehabilitation is feasible, safety and benefits. Participation in exercise training sessions up to five times per week may be helpful to optimize gains in exercise capacity for individuals undergoing a short-duration preoperative exercise based pulmonary rehabilitation program.

5. Comorbidities and physical activity
COPD is commonly associated with one or more medical comorbidities. These comorbidities, in part, reflect several of the systemic manifestations of the disease, and have significant impact on individuals’ symptoms and medical outcomes. Indeed,
the importance of comorbidities and systemic manifestations of COPD is reflected in the Global Initiative for Chronic Obstructive Disease definition of COPD, which states that “COPD, a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in individual individuals”. It is now clear that COPD is a heterogeneous disease with many manifestations reaching far beyond the lungs. These systemic manifestations are likely to be, at least in part, the result of shared mechanisms that also contribute to the structural and functional changes within the lungs, including systemic inflammation, altered apoptosis, and oxidative stress. This occurs in other diseases than COPD. In the study, Kostorz, Jastrzebski and co. shows, that comorbidities no lung function or mobility are the leading factors of impairments of daily activity in patients with sarcoidosis. Physical activity and regular exercise are both recommended and beneficial not only for individuals with COPD, but also for individuals with cardiovascular disease, musculoskeletal disease, obesity, diabetes, peripheral vascular disease, and most other chronic medical conditions. Thus, exercise training in the context of pulmonary rehabilitation is extremely important for individuals not only with COPD and comorbidities.

6. Technology-assisted exercise training.
Telehealth (telemonitoring and telephone support) is a promising way of delivering health services to individuals, particularly for those living in isolated areas or without access to transportation; however, to date, there is limited evidence of the use of technology for pulmonary rehabilitation. The technology employed ranges from simple pedometers through to mobile phone technology to support the exercise training component of pulmonary rehabilitation. A large controlled trial (n = 409) has shown that a pulmonary rehabilitation program delivered from a large, expert rehabilitation center to smaller, regional centers via videoconferencing resulted in equivalent outcomes for exercise capacity and quality of life. One other small trial in individuals with moderate to severe COPD who had completed at least 12 sessions of outpatient pulmonary rehabilitation found that telemonitoring by health care professionals reduced primary care contacts for respiratory issues compared with usual care. A systematic review of pedometer feedback in promoting activity in adults has shown that pedometers are effective in this regard, but only if they employ a physical activity target, such as 10,000 steps. There is more evidence on the effects of telemedicine for COPD disease management, which may pave the way to “tele-rehabilitation. There is a great deal of variability between studies in terms of interventions and approach. Results showed that home telehealth (home telemonitoring and telephone support) decreased rates of hospitalization and emergency department visits, whereas findings for hospital days varied between studies. The mortality rate tended to be greater in the telephone-support group compared with usual care, but the difference was not statistically significant.

7. Cost-effectiveness of pulmonary rehabilitation programs.
Although pulmonary rehabilitation is one of the most cost-effective therapies for individuals with chronic respiratory disease, suboptimal payer knowledge and awareness of pulmonary rehabilitation contributes to a large shortfall in funding for pulmonary rehabilitation programs. Insufficient funding leads to an inadequate number of pulmonary rehabilitation programs to meet patient needs as well as inadequate resources within existing programs. Adequate funding is essential for pulmonary rehabilitation program availability, capacity, effectiveness and viability. More study is also needed regarding the cost-effectiveness of pulmonary rehabilitation relative to other therapies for respiratory disorders other than chronic obstructive pulmonary disease (COPD).

Reference
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