

Keywords: COPD; Palliative Care; Quality of Life; Minimally Invasive Strategies; Emphysema; Elderly

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a commonly-encountered, preventable and treatable multifaceted inflammatory lung disease that has the characteristic features of limitation of airflow owing to airway and/or alveolar pathology, cough and dyspnea. It evidently and implacably impairs the quality of life of patients suffering from the disease [1]. Patients usually report to healthcare facilities when they develop an acute exacerbation of symptoms, and these exacerbations are financially and, mentally draining due to poor clinical outcomes, and associated with high morbidity as well as mortality. Therefore, managing an acute exacerbation must include decreasing the risks of further exacerbation as an imperative goal of treatment for any healthcare system, especially in high-prevalence areas [2, 3]. Currently, no definitive treatment is available to combat this condition. Therefore, it implies that all these patients require palliative care for the provision of a good quality of life and to maintain the vital functioning of the patients throughout the course of the disease, which is often lacking in quantity, as well as in the quality of care offered routinely.

Stage of the disease

Contemporary medical therapy is predominantly centered on the addressal of the primary pathophysiology, i.e., inflammation and airway narrowing which is responsible for symptoms of airflow obstruction symptoms- shortness of breath, cough, chest tightness, and mucus production. It has its limitations and presents frequent and numerous unmet needs. Even with widespread application, the acceptance of and acquiescence to Metered Dose Inhalers (MDIs) are difficult to achieve.

The general dispersion of drugs in the lung fields, particularly the periphery, remains a challenge for the treating physician. Moreover, in cases of super-added infections/inflammation, acute changes in lung physiology defeat the therapeutic effect of inhaled medications [4, 5].

Quality of life (QoL) is markedly reduced in COPD patients, necessitating the need for measures to improve QoL in a holistic approach to managing these cases. Prior longitudinal studies in

a wide range of patients with COPD at the Global Initiative for Obstructive Lung Disease (GOLD) stage have constantly described an average decline rate in FEV₁ and FVC as ~30 mL/year and ~40 mL/year respectively on annual basis [6, 7]. Additionally, the decrease in FEV₁ specific for patients with stage II and III GOLD COPD is in

With the use of this device, an improvement in health status demonstrated by the SGRQ score, a decrease in the incidence of acute exacerbations, and an increase in patient satisfaction was observed in a study by Sethi et al. enrolled 69 patients with COPD with chronic bronchitis for 26 weeks [10]. 85% of the patients enrolled in the lung ute group found the device effective and wanted to continue to use this device. Several other studies have also shown improvement in health status or stabilization of symptoms and reduction in acute exacerbations.

No adverse effects are observed related to the use of lung ute. However, the main drawback as in the above-mentioned study was the lack of objective measurement of increased mucociliary clearance.

A study by Elhawary A et al. later showed that sputum samples taken after induction using lung ute contained a higher number of cellular components, fibrinogen, elastase levels and a higher purulent score. thus, confirming that the mucus was derived from the lower respiratory tract [12]. Therefore, it is reasonable to conclude that this study established that the lung ute helps to remove mucus from the lower airways.

Conclusion : Bronchial rheoplasty is an endoscopic technique that uses nonthermal pulsed electrical fields to ablate the

lowinablhesiologistTj0.135084 1.575 -1.83 Td(Bro4eref systemadelise)ut sed elethermal pulctrical elds tat useis

st0.16 0 -(airdease i thacerbations.)Tjj/T11 1 Tf0.3008 Tw T*75 -1.83 Td(A sMe al)0.cryospra

- Reduction in the inhomogeneity of regional ventilation and perfusion that improves ventilation-perfusion matching and results in improved alveolar gas exchange and effectiveness of ventilation.

In the *BeLieVeR-HiFi* trial, 50 patients were enrolled and divided into two groups of 25 each; the mean predicted FEV₁ was 31.7%. The primary endpoint of the study was met as FEV₁ increased by 24.8% in the treatment group and by 3.9% in the control group [intergroup difference of 20.9% (95% CI 4.3% to 37.5%); *p* = 0.033]. This showed significant improvement in FEV₁ in the intervention group compared to the control group [27].

Similar results were seen in the IMPACT study, which was a prospective multicentre randomized control trial. Patients were divided into the EBV group plus standard of care (SoC) or SoC alone. 93 subjects were recruited and after a period of 3 months after the procedure, an improvement in FEV₁ from baseline was $13.7 \pm 28.2\%$ in the EBV group and $-3.2 \pm 13.0\%$ in the SoC group (mean difference between groups, 17.0%; *P* = 0.0002) was observed. Other parameters also showed significant improvement in the EBV group, which were SGRQ and a walk distance of 6 minutes [28].

Thus, endobronchial valve placement avoids harmful effects of surgery and avoids the risks of anesthesia in elderly patients with COPD. Adverse effects associated with this strategy are minimal and rare, but pneumothorax is a dreaded complication, which should be managed promptly with preparations already made.

Conclusion: Patients who are battling COPD have their lung tissues damaged due to an interplay of oxidative stress, cellular degeneration, and inflammatory insults. Stem cells are cells that have the ability to divide naturally or induced into either a cell, tissue, organ, or system. Similarly, depending on the differentiating potential, stem cells can be unipotent, multipotent, or pluripotent. Based on the origin of stem cells, they can be mesenchymal stem cells, hematopoietic stem cells, etc. In addition, depending on the source from which mesenchymal stem cells are derived, they can be derived from adipose tissue, bone marrow (BM), or umbilical cord (UC) mesenchymal stem cells (MSCs). Stem cells have provided medical researchers with an opportunity to improve the function and pliability of the system. They can help repair the tissue and have rejuvenation potential.

Stem cell therapy might exert its effects through the following mechanisms: [29]

- Reducing apoptosis of epithelial cells in the lungs.
- Improving the structure of damaged lung tissue.
- Promoting the proliferation of a variety of cells in the lung and facilitating the self-repair of lung tissue.
- Improving pulmonary function to some extent.
- Reducing systemic inflammatory response and promoting the secretion of a variety of anti-inflammatory mediators.

The first clinical trial of stem cell therapy in patients with COPD

A crucial factor in the productive implementation of these strategies is an optimal patient selection, therapeutic approach, as well as
