DOI: https://doi.org/10.53350/pjmhs2023172434

ORIGINAL ARTICLE

Short-Term Vs. Long-Term Glucocorticoids in COPD Exacerbation: A Comparative Efficacy Study

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ABSTRACT

The current study aims to evaluate the comparative efficacy of short-term and long-term glucocorticoid treatment in patients with COPD exacerbation. A randomized clinical trial will compare the effectiveness of short-term and long-term glucocorticoid treatments in COPD exacerbation. One hundred ninety patients will be recruited and randomized into two groups: a short-term glucocorticoid group and a long-term glucocorticoid group. The primary outcomes will be assessed at the end of the treatment period to determine the efficacy of the treatments. Secondary effects will include quality of life, length of hospitalization, and adverse events. The results of this study will provide insight into the comparative efficacy of short-term and long-term glucocorticoid treatments in COPD exacerbation.

Objective: Comparative efficacy of short-term (5-days) versus long-term (10-days) glucocorticoids at equivalent doses in managing COPD patients with acute exacerbations.

Materials and Methods: Pakistan Institute of Medical Sciences (PIMS), Islamabad, conducted this randomized clinical trial in the inpatient pulmonology department. This research took six months following ethical clearance. The experiment included 190 patients in two groups of 95. Patients in the two groups were randomly administered Tab—prednisolone 5mg (40mg/24 Hours) for five days or ten days. Using a carefully constructed pro-forma, postgraduate residents gathered data on five parameters (FEV1, FEV1/FVC, Arterial Blood Gases, mMRC Dyspnoea Scale, Sputum color and amount, presentation with identical symptoms within 30 days following discharge).

Results: Patients averaged 58.13 ± 11.12. Long-term patients were 58.34 ± 11.53 years old, whereas short-term patients were 57.93 ± 10.752. The short-term group included 86 (90.53%) male and 9 (9.47%) female cases, whereas the long-term group had 89 (93.68%) male and 6 (6.32%) female cases. Sputum color was normal in all groups after therapy. Short-term and long-term therapy groups had mean FEV1 changes of 8.12±4.85 and 7.14± 1.75, respectively. Following treatment, short-term mMRC was significantly lower (2.14±0.32) than long-term (2.73±0.44), with p-value < 0.001. The short-term group mMRC mean change was 1.67±0.53 compared to the long-term group 1.07±0.26, p-value < 0.001. Sputum amounts changed by 2.63 ± 1.67 in the short-term and 2.49 ± 0.72 in the long-term groups. Both groups had similar mean sputum quantities before, after, and after treatment, with a p-value > 0.05. Both groups had the same ABG parameter mean change following therapy. One month after discharge, neither group relapsed.

Conclusion: The efficacy of short-term (5-days) glucocorticoids is better than long-term (10-days) glucocorticoids at equivalent doses in terms of mMRC reduction. At the same time, the therapeutic effect was statistically the same in both groups regarding improvement in FEV1, sputum color, sputum quantity, all parameters of ABGs, and relapse rates.

Keywords: COPD, exacerbation, glucocorticoids, efficacy

INTRODUCTION

COPD is 2.1% in Pakistan and 5% globally. 1 Acute exacerbation of COPD symptoms requires a medication change or hospitalization. AECOPD is 30% idiopathic. Pseudomonas Aerogenosa, Moraxella catarrhalis, Klebsiella pneumonia, and Hemophilus Influenza are the most prevalent bacteria and viruses that cause COPD exacerbation[1]. AECOPD is treated with systemic corticosteroids. However, there is no agreement on dose, duration, or route 2. A recent US research found that low corticosteroids were better for AECOPD than high dosages regarding side effects and hospital stay, but not hospitalization[3]. Retrospective cohort research compared brief-term (<5 days) corticosteroids to long-term (>5 days) in ICU patients with AECOPD. Brief-term was better regarding treatment failure and hospital stay but had comparable adverse effects. Three of four randomized controlled studies examined varied durations of systemic steroids, dyspnea, hospitalization, exacerbation, treatment failure, adverse events, FEV1, FVC, and PaO2. Did not change. Many investigations found that 3-, 5-, and 7-day steroid regimens are similarly effective[4]. AECOPD. The 2014 GOLD strategy advises five days of 30–40 mg prednisolone[5]. Symptoms, PaO2, FEV1, FEV1/FVC, relapse, treatment failure, mortality, and adverse events did not differ between short (<7 days) and protracted (> seven days) AECOPD therapy in a meta-analysis. They are considering the non-inferior clinical outcome in an acute episode of COPD in patients receiving corticosteroids for a shorter period at equivalent doses compared to a longer period, as well as the benefits of reduced adverse events, low cost, and increased compliance. No need to taper off; this approach is the best way to treat indoor and outdoor COPD patients[6,7].

MATERIALS AND METHODS

This Randomized Clinical Study was conducted in the inpatient pulmonology department at the Pakistan Institute of Medical Sciences (PIMS), Islamabad. This research took six months following ethical clearance. The experiment included 190 patients in two groups of 95. Patients in the two groups were randomly administered Tab—prednisolone 5mg (40mg/24 Hours) for five days or ten days. Using a carefully constructed pro-forma, postgraduate residents gathered data on five parameters (FEV1, FEV1/FVC, Arterial Blood Gases, mMRC Dyspnoea Scale, Sputum color and amount, presentation with identical symptoms within 30 days following discharge).

Statistically analysis: Data was entered and statistically analyzed using SPSS software version 21.0. The categorical variables such as gender and symptoms (mMRC Dyspnea Scale, sputum color and quantity) were measured as frequency and percentages. Numerical variables such as age, FEV1, FEV1/FVC, and Arterial blood gases were computed as mean and standard Deviation. The Chi-square test was used to compare sputum color in both groups. An Independent sample t-test was used to compare the Mean, Standard Deviation of numerical variables (FEV1, FEV1/FVC, and ABGs) in both groups. The level of Significance was set as a probability value of ≤0.05.

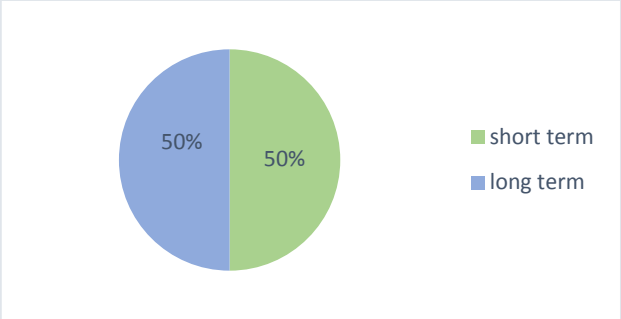

Figure 1: Groups distribution chart

Table 1: Characteristics of study groups

Characteristics	Long term	short term
Age (yrs)	58.13 ± 11.12	58.34 ± 11.53
Male (%)	90.53	93.68
Female (%)	9.47	6.32

Table 2: Comparison Of FEV1, FEV1/FVC, Mmrc Dyspnoea Scale, Sputum Colour And Quantity, Arterial Blood Gases In Both Groups

Group	Short Term	Long Term
FEV1 (L)	2.09 ± 0.44	2.02 ± 0.41
FEV1/FVC (%)	67.89 ± 1.59	68.01 ± 1.63
mMRC Dyspnoea Scale	2.14 ± 0.32	2.73 ± 0.44
Sputum color	Normal (100%)	Normal (100%)
Sputum quantity	2.63 ± 1.67	2.49 ± 0.72

Table 3: Groups Distribution Mean Wise

Groups	N
Short term	95
Long term	95
Total	190

Table 4: Demographic Characteristics

Short Term	58.13 ± 11.12
Long Term	57.93 ± 10.752
Total	190

Table 5: Clinical Characteristics

FEV1	Number of patients
Short Term	8.12 ± 4.85
Long Term	7.14 ± 1.75
Total	190
FEV1/FVC	
Short Term	0.78 ± 0.13
Long Term	0.77 ± 0.14
Total	190
mMRC	
Short Term	2.14 ± 0.32
Long Term	2.73 ± 0.44
Total	190
Sputum	
Short Term	2.63 ± 1.67
Long Term	2.49 ± 0.72
Total	190

Table 6: Comparison Of FEV1 ,Mmrc,Sputum Quantity ,Abgs PO2,Abgs PH Before And After In Change

	Short Term Glucocorticoid (n=95)	Long Term Glucocorticoid (n=95)
FEV1 (Pre)	2.14±0.32	2.73±0.44
FEV1 (Post)	2.81±0.54	2.80±0.56
mMRC (Pre)	3.81±0.43	3.80±0.42
mMRC (Post)	2.14±0.32	2.73±0.44
Sputum Quantity (Pre)	3.81±0.43	3.80±0.42
Sputum Quantity (Post)	2.63±1.67	2.49±0.72
ABGs PO2 (Pre)	94.92±5.72	95.17±5.95
ABGs PO2 (Post)	95.54±5.82	95.53±5.98
ABGs PH (Pre)	7.36±0.50	7.36±0.51
ABGs PH (Post)	7.43±0.49	7.43±0.50

Table 7: Comparison of FEV1, mMRC, Sputum quantity, ABGs PO2 and ABGs PH after therapy

	Short Term Glucocorticoid (n=95)	Long Term Glucocorticoid (n=95)
FEV1	8.12±4.85	7.14±1.75
mMRC	1.67±0.53	1.07±0.26
Sputum Quantity	2.63±1.67	2.49±0.72
ABGs PO2	95.54±5.82	95.53±5.98
`ABGs PH	7.43±0.49	7.43±0.50

Table 8: Comparison of relapse and treatment failure in both groups

	Short Term Glucocorticoid (n=95)	Long Term Glucocorticoid (n=95)
Relapse	0 (0%)	0 (0%)
Treatment Failure	0 (0%)	0 (0%)

DISCUSSION

Chronic obstructive pulmonary disease (COPD) is a dynamic, ceaseless inflammation of airways with airflow impediment, which is not completely reversible in nature[8]. COPD is reported to have a pervasiveness of approximately 10% in those older than 40 years worldwide. Overall 13 million grown-ups were notified in 2011 in the US to be affected by this disorder. There may be a fair chance of a comparable number of undiagnosed patients in America. COPD9,10 contributes a major bulk of mortality and morbidity. WHO has identified COPD as the seventh-highest reason for handicap and the fourth-frequent reason for death globally. In the US, COPD is the 3rd major cause of death, contributing to 138,000 deaths every year[11].

Considering its huge burden plus health-related consequences, perceiving its cultural and monetary effects is basic. The cultural weight of COPD keeps on becoming high because of proceeded tobacco use and reliance, alongside a general increment in the future, with the latest proof evaluating more than 700,000 emergency clinic releases every year[12]. Besides, the related financial effect is immense. The newest expenditure amounted to $50 billion in the US, split into $30 billion direct and $20 billion indirect. It has been reported that COPD exacerbations project 50% to 70% of the natural health care costs spent on COPD[13]. Information revealed that almost seventy-five percent of COPD patients suffer from its exacerbation over one year, and the number of exacerbations per individual may go as high as 3.8.13. In general, the majority of COPD exacerbations can be managed on an outpatient basis. Yet, hospitalization may be needed in certain cases[14]. Patients requiring hospitalization for intense compounding experience the ill effects of a significant decrease in lung work with every intensification[15]. The decline in lung work expands the risk of medical clinic readmission or passing essentially with every compounding. Viable measures for the reduction in COPD exacerbations as well as their length, are paramount. Corticosteroids have been regarded for a long time as the backbone in the treatment of acute worsening of COPD. Still unclear are the portions and timings of corticosteroids in AECOPD, yet their promising role is undoubted[16]. Chronic obstructive pulmonary disease (COPD) is a dynamic, ceaseless inflammation of airways with airflow impediment, which is not completely reversible in nature[17]. COPD is reported to have a pervasiveness of approximately 10% in those older than 40 years worldwide[18]. Overall 13 million grown-ups were reported in 2011 in the US to be affected by this disorder. There may be a fair chance of a comparable number of undiagnosed patients in America[19]. Our study is limited in sample size, short chasing period, assessment of unfriendly effects, all-cause mortality, estimation of response in the context of Eosinophils count, and assessment of different parameters like FEV1, mMRC dyspnea scale, ABGs, and general well-being after one month of discharge[20].

CONCLUSION

The efficacy of short-term (5 days) glucocorticoids is better than long-term. (10 days) glucocorticoids at equivalent doses in terms of

mMRC reduction. In comparison, the therapeutic effectiveness was statistically the same in both groups regarding improvement in FEV1, sputum color, quantity, all parameters of ABGs, and relapse rates.

Authors' Contributions:

Muhammad israr: Literature Review, manuscript drafting.
Zia ul haq: Data collection & statistical analysis
Muhammad shabbir: Data Interpretation
Jahangir khan: Proof reading
Muhammad kashif khan: Manuscript drafting,
Hina bukhari: Expert opinion and manuscript revision**.**

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