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Original Research Article

Assessment of Symptoms after Treatment in Patients Suffering from Asthma at a Tertiary Health Care Centre

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ABSTRACT

Background: Asthma is considered as a major cause of morbidity in both developing and developed countries. Spirometry is routinely used for the assessment of the degree of airway obstruction and its response to treatment. Hence; we planned the present study to assess the clinical changes occurring during the treatment of asthma in asthmatic patients.

Materials & Methods: The present study included assessment of 60 patients who reported with the chief complaint of acute asthma. The patients were followed up at six weeks, 12 weeks and six months after treatment and assessed clinically in terms of symptom score. Spirometric measurements were performed at every visit. All the results were analyzed by SPSS software.

Results: At baseline and 6 weeks' time, the mean value of FEV_1 was 2840.12 and 2860.37 ml respectively. Mean value of FEV_1 at 12 weeks and 6 months' time was 2885.63 and 2897.96 ml respectively. Mean value of FVC at baseline and 6 weeks' time was 3510.37 and 3536.67 ml respectively. Mean value of FVC at 12 weeks and 6 months' time was 3550.23 and 3580.45 ml respectively. Non-significant results were obtained while comparing the ratio of mean value of FEV_1 and mean value of FVC with time. p-value for improvement pulmonary parameters at different time intervals. Significant results were obtained while comparing the symptom score at 6 months' time.

Conclusion: Understanding of both psychological and environmental factors is also necessary part from the drug therapy in controlling asthma.

Key words: Asthma, Spirometry, Treatment.

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INTRODUCTION

One of the chronic respiratory disorder prevalent in the world is Asthma. It is considered as a major cause of morbidity and contributes a major role in high health care expenditure.[1] Inflammation and hyper-responsiveness are two of the common pathologic features encountered clinically in all the asthmatic patients. These features are interrelated, but not totally dependent on each other. Airway inflammatory changes include increased airway mucus secretions, airway wall edema, inflammatory cellular infiltrates, epithelial cell damage, smooth muscle hypertrophy and submucosal fibrosis.[2] Spirometry before and after bronchodilator inhalation is necessary to confirm the diagnosis of asthma and to distinguish it from other obstructive lung diseases.[4] Owing to asthma's variability, a single spirometry test is not always successful in diagnosing or ruling out asthma definitively, but it does allow immediate, objective determination that airflow obstruction is present.[5] In contrast, normal spirometry in the presence of persistent respiratory symptoms should be a prompt consideration of an alternative diagnosis, such as congestive heart failure, interstitial lung disease, respiratory muscle weakness, obesity- related causes, or pulmonary vascular disease.[6] Hence, the present study was planned to assess the clinical changes occurring during the treatment of asthma in asthmatic patients.

MATERIALS & METHODS

The present study was conducted in the department of general medicine, KPC Medical College and Hospital, Kolkata, West Bengal (India) and included assessment of all the patients admitted in Tertiary Health Care Centre with diagnosis of acute asthma. Ethical approval was taken from the institutional ethical committee and informed consent was obtained after explaining in detail the entire research protocol. A total of 60 patients belonging to the age group of 25 to 50 years who fulfilled the inclusion and exclusion criteria were included in the present study. The FVC and FEV1 values were measured using a dry rolling seal spirometer. Both measurements were made before and 30 min after inhalation of 400 mg of salbutamol. The post-bronchodilator FEV1 values were selected to reflect loss of lung function as in other studies following lung function in patients with asthma over time.[6,7] Patients were seated comfortably in a non-swivel chair. Nose clips

were applied, and a special mouthpiece was used. Patients were allowed to breathe normally while a loudspeaker component of the instrument delivered intermittent multi-frequency impulses over a minimum of 30 second duration. A trained technician guided, comforted and assisted the patient in following the tracing as 3 sinusoidal readings were obtained. All the values were assessed at various time intervals. Assessment of the following parameters was done during the study period:

- FEV_1 (forced expiratory volume in 1 second),
- FVC (forced vital capacity),
- FEV_1/FVC ratio.

All the results were analyzed by SPSS software. Chi square test and student t test was used for the assessment of level of significance.

RESULTS

Table 1 and Graph 1 show the mean value of pulmonary functional parameters at baseline and follow-up times. At baseline and 6 weeks' time, the mean value of FEV_1 was 2840.12 and 2860.37 ml respectively. Mean value of FEV_1 at 12 weeks and 6 months' time was 2885.63 and 2897.96 ml respectively. Mean value of FVC at baseline and 6 weeks' time was 3510.37 and 3536.67 ml respectively. Mean value of FVC at 12 weeks and 6 months' time was 3550.23 and 3580.45 ml respectively. Non-significant results were obtained while comparing the ratio of mean value of FEV_1 and mean value of FVC with time. Table 2 shows the p-value for improvement pulmonary parameters at different time intervals. Significant results were obtained while comparing the symptom score at 6 months' time.

Table 1: P-value for value of pulmonary functional parameters at baseline and other follow-up times.

Time	Mean FEV_1 (ml)	Mean FVC (ml)	p-value for Mean FEV_1/ FVC during follow-up time
Baseline	2840.12	3510.37	0.82
6 weeks	2860.37	3536.67	
12 weeks	2885.63	3550.23	
6 months	2897.96	3580.45	

* Significant

Graph 1: Value of mean pulmonary functional parameters at baseline and other follow-up times

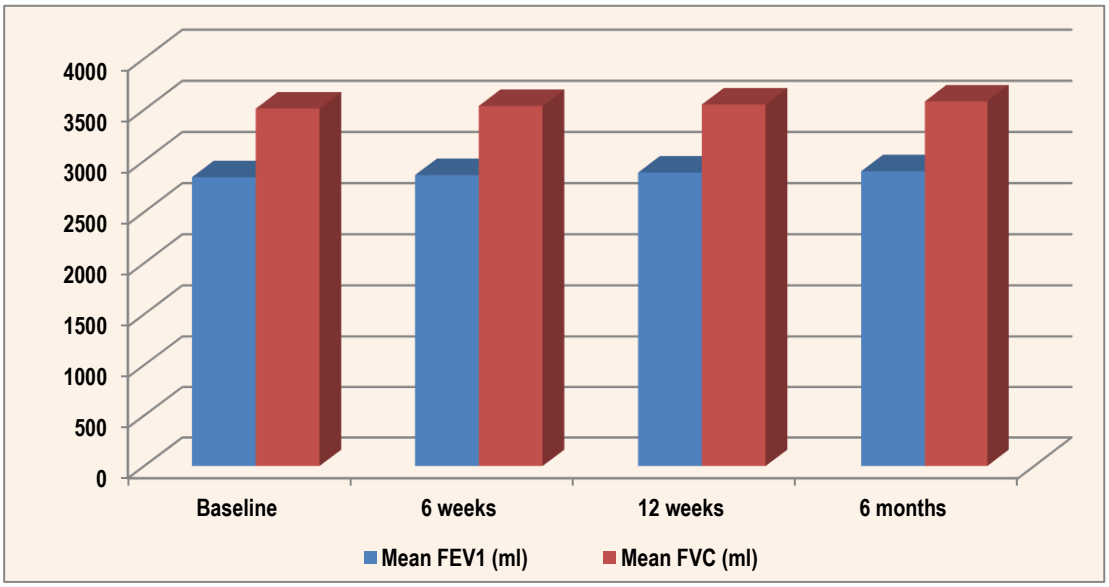

Table 2: p-value for improvement in mean pulmonary parameters at different time intervals

Parameter	6 weeks time	12 weeks time	6 months time
FVC	0.52	0.71	0.01*
FEV_1	0.39	0.98	0.03*

*: Significant

DISCUSSION

Asthma control and severity have conventionally been assessed using several indices, which have usually included symptoms, level of treatment and lung function.[8] In clinical practice and in epidemiological studies, the objective measures of airflow obstruction are usually not used but rely on symptoms to assess disease control; though, some reports reveal that there may be a poor correlation between asthma symptoms and lung function measurements. In many instances, the discrepancy between these components is striking, and it has been proposed that the most abnormal feature be used to categorize the severity of asthma.[9,10]

Hence; we planned the present study to assess the clinical changes occurring during the treatment of asthma in asthmatic patients.

In the present study, we observed that significant improvement occurs in asthmatic patients when appropriate treatment and regular follow up is carried and this improvement is well highlighted in terms of the lung function measures. Haldar et al. compared differences in asthma outcomes using k-means cluster analysis and found that inflammation-guided management was superior leading to a reduction in exacerbation frequency in the inflammation-predominant cluster and a dose reduction of inhaled corticosteroid in the symptom-predominant cluster. Cluster analysis offers a novel multidimensional approach for identifying asthma phenotypes that exhibit differences in clinical response to treatment algorithms.[11]

Wildhaber JH et al. evaluated the usefulness of subjective and objective measures of the curvature in the descending phase of the MEFV curve for the assessment of asthma and concluded that that individual lung function variables do not correlate well with symptoms, whereas subjective curvature assessment is thought to be helpful.[12] Singh M et al prospectively compared improvement in quality of life (QOL) score with objective measures of pulmonary function in children with persistent bronchial asthma receiving inhaled corticosteroid (ICS) therapy. QOL score (measured by an indigenous tool), forced expiratory volume in first second (FEV1), forced vital capacity (FVC), peak expiratory flow rate (PEFR) and asthma symptom score were measured in newly diagnosed children with persistent asthma- before, during and eight weeks after ICS therapy. There was a significant improvement in all parameters compared at each follow up visit and at termination of the study (p less than 0.05). The magnitude of improvement in QOL was similar to improvement in objective measures of pulmonary function; although these changes were not similar to changes in asthma symptom score. Improvement in QOL score is likely to be a sensitive measurement of functional improvement in asthmatic children on treatment; however subjective sensation of improvement lags behind objective measures.[13]

Zhang QL et al. characterized the spirometry of preschool children and concluded that spirometric testing is feasible in preschool children by using imagery methods and may be useful for both clinical practice and research as the study found that all lung volumes and flow rates increased with age, height as well as weight growth in both gender groups.[14]

CONCLUSION

From the above results, the authors concluded that understanding of both psychological and environmental factors are also necessary part from the drug therapy in controlling asthma.

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