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Original Research Paper

Pulmonary Medicine

PEAK EXPIRATORY FLOW RATE (PEFR) VALUES OBTAINED WITH WRIGHT'S PEAK FLOW METER AND DIGITAL SPIROMETER IN OBSTRUCTIVE AIRWAY DISEASE (OAD) PATIENTS – A COMPARATIVE STUDY

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ABSTRACT

Introduction: Peak expiratory flow rate (PEFR) is the highest flow achieved from a maximum forced expiratory maneuver and is a good modality in diagnosing and monitoring Br.asthma; in COPD it gives a rough estimate of the severity of obstruction.Normal values in males and females range between 320-550L/min. PEFR values can be obtained by a Peak Flow Meter or by standard Spirometer. **Aims And Objectives:** To compare PEFR values obtained by Wright's Peak Flow meter and those obtained by a Digital Spirometer and to understand Whether PEFR values are reliable in the diagnosis and monitoring of Obstructive Airway Disease. **Materials And Methods:** 75 Consecutive patients who presented with a history of COPD, Br.asthma or Bronchiectasis to the Respiratory Medicine OP, Govt General Hospital, Nellore, AP were recruited to the studyand PEFR values were recorded by both Peakflowmeter and Spirometer. **Results:** The range of PEFR values obtained was between 120-480 L/min .and the difference was in the range of 9-164 L/min. **Conclusion:** In the present study the difference in values is not very significant andhence PEFR can be used as a diagnostic & monitoring tool in OAD.

KEYWORDS :

INTRODUCTION:

Peak Expiratory flow rate (PEFR) is the highest flow achieved from a maximal forced expiratory maneuver, started without hesitation from a position of maximal lung inflation[1]. The normal range of PEFR in healthy individual is wide, ranging from 450-550 L/min in adults males to 320-470 L/ min in adult females[2]. The amount of air expired in the first 100-200ms is considered as PEFR.

Peak expiratory flow rate is effort dependent and shows diurnal variation more during nights[3]. It also decreases with age, when there is decrease in respiratory muscle strength. It measures large airway function essentially. Even then, it is a good tool in the diagnosis and monitoring of Bronchial Asthma, especially nocturnal Asthma and Occupational asthma. The degree of decrease of PEFR does not correlate well with degree of reduction in FEV1, because FEV1, measures both large and small airway function.

PEFR can be measured with an easy-to-carry, cheap apparatus called the Peakflowmeter; Wright's Peakflowmeter is the one that is widely used. It is also obtained as a part of a Spirometry report, along with FEV, FVC, MVV and others. The highest of three readings is taken as the Peak flow[4]. Chronic Obstructive Pulmonary Disease (COPD) and Bronchiectasis form part of the OAD syndrome along with Br.asthma, cystic fibrosis and Bronchiectasis[5]. A good estimate of the severity of obstruction can be had by measuring PEFR in individuals suffering from COPD and Bronchiectasis.

TYPE OF STUDY

Cross –Sectional, Comparative study

MATERIALS AND METHODS:

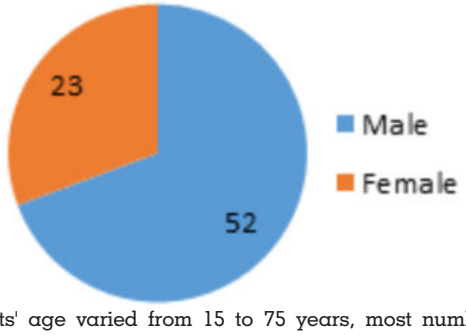
75 Consecutive patients who presented with a history of COPD, Br.asthma or Bronchiectasis, to the Respiratory Medicine OP, Govt. General Hospital, Nellore, AP between August 1st 2022 and September 30th 2022, (2 months) were recruited to the study. All the patients had Chest, X-ray, CT Chest reports and previous Spirometry reports with them. The study and its procedure were explained to them thoroughly. PEFR was obtained with Wright's Peakflowmeter and a Digital Spirometer and the readings noted. The Best value of three maneuvers was recorded, with Peakflowmeter and Spirometer.

Statistical Analysis:

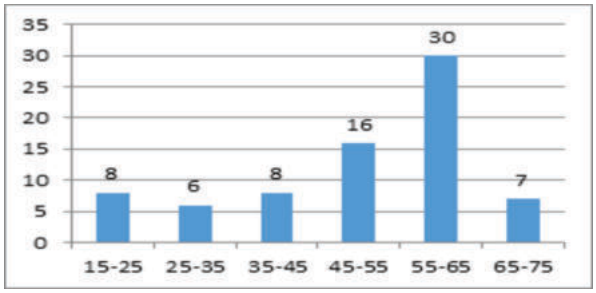
Results were expressed as mean and percentages. Epiinfo version 4.5 Software was used.

RESULTS:

Out of the study population of 75, 52(70%) were males and 23 (30%) were females

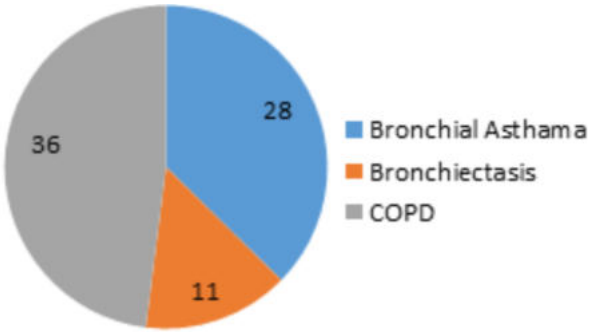


Patients' age varied from 15 to 75 years, most number of Patients (30patients, 40%) belonged to the 55-65 years age group.

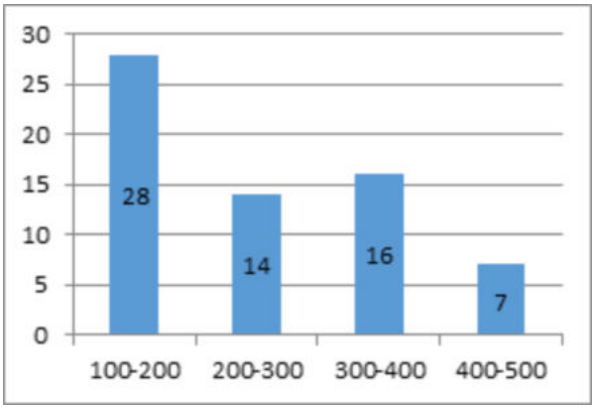


Out of the study Population of 75 patients28 had Br. Asthma (14

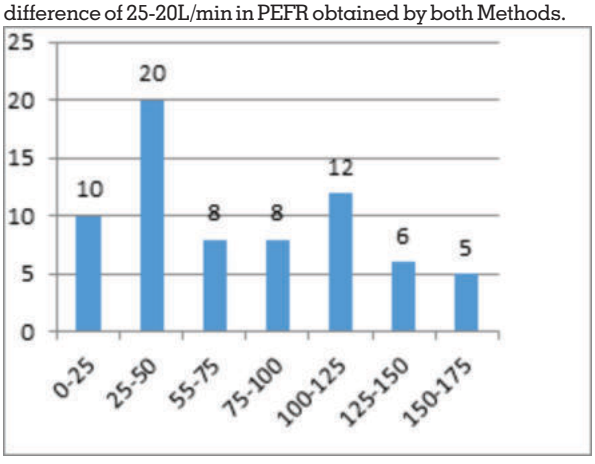
males and 14 females) 36 had COPD (30 males and 6 females) and 11 had Bronchiectasis (6 males and 5 females).



The Peak flow values were between 120-480 L/min in the study population. 38(50%) patients had a PEFR between 100-200 L/min 14 patients between 200-300 L/min and 7 patients had a PEFR between 400-500 L/min.



The difference in Peak flow Readings obtained by Wright's Peak flow meter and Digital Spirometer ranged between 9 L/min 164L/min. Most patients (26 patients, 35%) had a difference of 25-20L/min in PEFR obtained by both Methods.



DISCUSSION:

In the present study, most PEFR Values were between 100-200 L/min, (38 patients 50%) Peak flow readings obtained by Wright's Peak flow meter were more than the Spirometric PEFR in 48 patients (64%) Similar results were obtained by Tiwari etal[6]. and Takara et al[7] though they were studying healthy individuals and not OAD patients as in our study. In our study in 27 Patients, Spirometric PEFR was more than PEFR obtained by Wright's Peakflowmeter.

Studies done by Imbruce etal[8]. and G.Eichhenhorn et al[9] even showed statistically insignificant difference when PEFR was measured with different types of Peak flow meters.

In our study the difference in PEFR values btained by Peak flow meter and Spirometer anged between 9 L/min and 164 L/min and most patients (26 of the 75 study population) had a difference of 25-50 L/min, which is not very significant.

When compared to Digital Spirometers which are costly, need trained personnel to handle them, and a safe place to keep them, Peak flow meters are cheap, easy to handle and patients themselves can use them at home so that they can know by themselves the severity of their disease and self-monitor themselves.

CONCLUSION:

In our study though, there is a difference in PEFR values obtained by Peakflowmeter and Spirometry, it is not very significant Hence Peak flow meter is avery good device for diagnosing and monitoring of disease in patient with Br.asthma.In patients with COPD and in Bronchiectasis also a good idea of the severity of obstruction is obtained and the Peak flow meter can substitute the Digital Spirometer in resource strapped settings and emergency situations.

REFERENCES:

1. Quanjer PH, Lebontz MD, Gregg I et al , Peak expiratory flow, Conclusions and Recommendations of a Working Party of the European Respiratory society Eur Respiratory journal Suppl.1997.24:25-85
2. Jindal , Shankar,Raoof, Gupta and Agrawal Textbook of Pulmonary and critical care Medicine, Chapter 26 A, Section 5.
3. Udwadia, Kohli and Shah,Principles of Respiratory Medicine, chapter 33,page 463.
4. https//my. Cleveland clinic.org>……..
5. Alfred Fishman , Textbook of Respiratory Diseases, Vol, I, Chapter 1, Obstruction Airway Disease.
6. Tiwari, Bansal ,Sood, Kumar and Shah. Evaluation of Peak Expiratory flow rate between Spirometer and Peak flow meter INTJA dv INTEGR 2016: 1:93-4
7. Takara, Quas, Pessoa, JamamiComparision of 5 portable Peakflowmeters (Sao Paulo) 2010: 65: 469-74.
8. Imbruce et al Standardized testing of 4 commercially available Peak flow meters. Immunol allergy pract 1991: B: 49-70.
9. Eichenhorn,Beaucham, Harper,Ward An assessment of three portable Peak flow meters.Chest 1982,82: 306-920.