Spirometry In Classification and Management of Childhood Asthma

INTRODUCTION:

Asthma is one of the most common chronic illness of childhood and likely to have an impact on the social and emotional aspects of lives of the children and their families. Measurements of lung function provide an assessment of the severity, reversibility and variability of airflow limitation and help to confirm the diagnosis of asthma. Spirometry is the lung function test of choice for diagnosing asthma and assessing asthma control in children above 6 year of age. Accurate measurement of lung function is necessary to assess and optimal management of asthma.

RESONALE:

Inclusion Criteria:
1. All Children aged 6 to 12 years attending asthma clinic.
2. Children newly diagnosed or known cases of asthma.

Exclusion Criteria:
1. Children aged less than 6 years and more than 12 years.
2. Children with underlying cardiac or other illness (congenital anomalies of larynx, trachea or bronchus, cystic fibrosis and other mucociliary defect, gastro-oesophageal reflux disease).
3. Children consistently unable to complete pulmonary function test on repeated three attempts due to various factors (time interval between attempts is one week).
4. Children whose parents refuse to give consent for study.
5. Children who lost follow up.

SELECTION CRITERIA:

METHODOLOGY:

This prospective study was conducted on children (n=52) attending asthma clinic in K.T. Children’s Hospital & Department of Pediatrics, P.D.U. Govt. Medical College, Rajkot during period of Oct 2016 to Sep 2018. Diagnosis and management of asthma was done on clinical bases on history, presenting signs and symptoms, clinical examination and spirometry as per Global Initiative for Asthma (GINA) 2015 guideline and National Asthma Education and Prevention Program (NAEPP) guidelines, 2007. All patients included in study were called for follow up and examined for minimum 3 times with minimum duration of gap between two to 3 months.

RESULTS & DISCUSSION

Comparison of change in mean FEV1 values with reference to other studies

As per the above table, at first visit, 50% of cases were either upgraded or downgraded on the basis of spirometry. In second and third visit, the treatment was not changed in majority of the cases. This is supported by study done by Nair S et al. When spirometry did not change treatment decision, the provider was more likely to maintain therapy than to increase or decrease therapy. In contrast, when spirometry did change treatment decisions, the provider was more likely to increase therapy or to maintain or decrease therapy without spirometry, provider often overestimated the degree of asthma control. This incorrect assessment could have resulted in suboptimal therapy.

Comparison of mean of percentage predicted value of FEV1 & FEF25-75 between three Spirometries

Comparison of mean of Inhaled steroid dose between Spirometries

As per ANOVA, when all the three samples were compared simultaneously, the P-value comes out to be 0.001 which is less than 0.05. This shows that there is a statistically significant difference in the FEV1 and FEF25-75 values between the three spirometries. It was observed from the above table that the mean treatment was in 2nd spirometry when compared to 1st spirometry. No such improvements were observed when 1st spirometry was performed after 3 months of 2nd spirometry. As per ANOVA, the P-value is 0.000 which is less than 0.05. In contrast, when spirometry was performed after 3 months of 2nd spirometry and then to further be upgraded or downgraded in 3rd spirometry, no significant improvement were observed on 3rd spirometry. So FEV1 and FEF25-75 can be useful parameter for monitoring of clinical status of asthmatic patients at least once in six months.

CONCLUSION:

Spirometry correlates poorly with clinical diagnosis in children with increased severity of asthma. So, spirometry is must to do in patients with more severe form of asthma for better diagnosis and management.

Spirometry is to be done in all children at the time of initial diagnosis of asthma. Use of spirometry at the time of initial diagnosis of asthma leads to an adequate treatment to the asthmatic children and there is lesser need of upgradation of treatment in subsequent visits.

Due to spirometry-based treatment modification, better asthma control was achieved and there was gradual decrease in requirement of inhaled steroid dosage. Thus, spirometry was used in controlling the treatment in asthmatic children.

To have improvement in different parameters of spirometry, it was seen that the minimal interval between two spirometries should be at least 3 to 6 months. So, spirometry is to be done for at least once or twice a year in all asthmatic children.

FEV1 and FEF25-75 are useful parameters in monitoring clinical status of asthmatic children.

REFERENCE: