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**A COMPARATIVE STUDY ON SPIROMETRIC REFERENCE VALUES BETWEEN MORRIS AND ROA EQUATIONS AMONG HEALTH NON-SMOKING FILIPINO ADULTS**

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MULTIPLE EXPOSURES TO PULMONARY REHABILITATION ON STABLE  
COPD PATIENTS**

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By: J. Teguh Widjaja, MD, Esterlita B. Medina, RT, RCP, Loreto J. Codamos, MD,  
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Race is an important variable in determining the normal reference values for pulmonary function tests (spirometry). Although there have been equations proposed for Filipino adults. Its validity remains uncertain. Between June 1997 up to May 1998, 2,628 pulmonary function tests were done at the Institute of Pulmonary Medicine, St. Luke's Medical Center. Among them, 483 normal subjects, 209 males and 274 females, were included in this study. We found significant differences between our actual values compared to predicted values using Morris equations almost in all parameters except for PEF in the male and Total group. There were also significant differences between values using Morris' equations and Roa's equations either in predicted values or in percent-predicted values. On the other hand, there were no significant differences when we compared our actual values with predicted values using Roa's equations. Furthermore, the differences of the interpretations using Morris and Roa equation are highly significant for both male and female subjects. Chi-square test also showed a significant proportion of subjects whose interpretation changed when the Morris equation was substituted with the Roa equation. The proportion of subjects whose interpretations changed from "Abnormal" using the Morris equation to "Normal" using Roa's equation is significantly higher compared with subjects whose interpretations using Morris' equation changed from "Normal" to "Abnormal" using Roa's equation ( $p=2 \times 10^{-22}$ ). Since our subject are healthy and non-smoking, we can suspect that there is over-diagnosis of obstructive or restrictive lung disease using Morris equations among these healthy Filipino subjects. Based on these results, Roa's prediction equations more accurately predicts PFT values of healthy non-smoking Filipino population than Morris' prediction equation. We recommended further multicenter studies to examine this preferably under the guidance of the PCCP. Phil Journal Chest Diseases. Vol. 7 No. 1 pp 1-7

## **NORMAL PULMONARY FUNCTION TEST AS PERFORMED AMONG FILIPINO SCHOOL CHILDREN. A Pilot Study**

By: Mary Ann B. Cruz, M.D., Charito B. Carbon, M.D., Nerissa Atienza-De Leon,  
M.D., Milagros S. Bautista, M.D., FPCCP, Teresita S. De Guia, M.D., FPCCP,  
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Forced expiratory spirometry in children enables clinicians to detect and quantify the presence of mechanical dysfunction, and define the nature of dysfunction whether obstructive, restrictive or mixed obstructive and restrictive. This study aims to determine reference standards in spirometry among Filipino school children, 6-12 years old using the Micro Loop II spirometer. Questionnaires were given to their parents to determine inclusions. Excluded were those with respiratory symptoms. There were 596 subjects included, 285 (47.8%) males (mean age  $8.842 \pm 1.838$ ) and 311 (52.2%) females (mean age  $8.794 \pm 1.943$ ). Mean heights were  $124.140 \pm 10.149$  and  $125.987 \pm 12.736$  centimeters for males and females, respectively. Mean forced expiratory volume in one second (FEV<sub>1</sub>) for males were 0.93, 1.09, 1.21, 1.35, 1.40, 1.74, and 1.98 liters for ages 6, 7, 8, 9, 10, 11 and 12, respectively while females of the same age had 0.90, 1.01, 1.13, 1.31, 1.44, 1.75, and 1.82 liters. Mean values obtained for forced vital capacity (FVC) for males were 0.96, 1.14, 1.26, 1.41, 1.50, 1.89, and 2.15 liters while for females 0.93, 1.05, 1.17, 1.36, 1.53, 1.85 and 1.93. Mean values of forced expiratory flow in 50% lung volume (FEF<sub>50%</sub>) were 1.70, 2.07, 2.09, 2.33, 2.53, 3.03 and 3.0 liters/second. Mean values of forced expiratory flow at 25% lung volume (FEF<sub>25%</sub>) for males were 1.03, 1.20, 1.15, 1.23, 1.11, 1.22, and 1.42; while those for females were 0.93, 1.07, 1.16, 1.33, 1.24, 1.51 and 1.54 liters/second, following the same age sequence. Significant differences of pulmonary function exist among Filipino male and female school children ages 6-12 years. Spirometric prediction equations were also derived. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp 8-14.

**NORMAL PEAK EXPIRATORY FLOW RATE TEST AS PERFORMED  
AMONG FILIPINO SCHOOLCHILDREN: A Pilot Study**

By: Mary Ann B. Cruz, M.D., Charito B. Carbon, M.D., Nerissa Atienza-De Leon,  
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Spirometry is the gold standard of determining pulmonary function. However, the peak expiratory flow rate (PEFR) can be measured with grater ease and is a means of following the patterns of airway obstruction on an ambulatory basis using the portable mini-Wright's peak flow meter. This study was therefore done with the aim to determine PEFR reference standards among Filipino schoolchildren, age 6-12 years old. Parental questionnaires were given to determine inclusion. Excluded were those with respiratory and allergic symptoms. Six hundred forty four subjects were included 327 males and 317 females. Mean PEFR for males were 175, 199.20, 213.40, 245.17, 253.95, 295.12 and 330.67 li/min for ages 6, 7, 8, 9, 10, 11 and 12 years old respectively while for females of the same age had 170.53, 180.49, 212.0, 235.48, 269.98, 305.35 and 321.35 li/min. Age and height were highly correlated with PEFR values. Multiple regression analysis was performed to determine prediction equation for PEFR based on age and height. A table is presented for the predicted PEFR values based on the age and height for Filipino males and females from the prediction equations. Significant differences of PEFR values exist among children 6-12 years old and between male and female subjects. Phil. Journal Chest Diseases. Vol. 7 No. 1 pp 15-20.

## **THE USE OF PEAK EXPIRATORY FLOW RATE MEASUREMENT IN OBSTRUCTIVE AIRWAYS DISEASES**

By: Meliton, Angelo, MD, Ocampo-Chuatico, Ma. Regina, MD,  
Punzal, Percival, MD, FPCCP, De Guia, Teresita, MD, FPCCP,  
Ma. Encamita Blanco-Limpin, MD, FPCCP and Lingad, Rosalina, MD, FPCCP

FEV<sub>1</sub> is the single most important pulmonary function parameter in airway obstruction. In a developing country like the Philippines, spirometry is not easily available due to socioeconomic constraints. This prospective study aims to determine the correlation of the peak expiratory flow rate (PEFR) measurement with FEV<sub>1</sub> of patients with obstructive lung diseases to determine its efficacy in determining post-bronchodilator response or reversibility and in classifying severity of obstruction. One hundred twenty-five subjects were enrolled and grouped into four: Group 1 (31 normal subjects), Group 2 (45 asymptomatic smokers), Group 3 (26 subjects with COPD), and Group 4 (23 asthmatics). All patients underwent PEFR measurement. This study showed that mean (% predicted) FEV<sub>1</sub> and PEFR values appear to approximate each other; indicative of a good correlation (Group 1: 99.68 ± 10.6 and 92.74 ± 11.8, respectively; Group 2: 96.89 ± 9.5 and 89.13 ± 11.6; Group 3: 46.80 ± 15.7 and 46.46 ± 16.5; Group 4: 81.56 ± 19.8 and 74.52 ± 18.8). This was best in the COPD group (p=0.885). PEFR is comparable to FEV<sub>1</sub>, values post-bronchodilator challenge in asthmatics and COPD. The asthmatics had reversibility (FEV<sub>1</sub> 81.56 ± 19.8 to 91.91 ± 16.4; PEFR 74.52 ± 18.8 to 79.70 ± 15.0) whereas the COPD showed irreversibility (FEV<sub>1</sub> 46.80 ± 15.7 to 52.38 ± 17.6; PEFR 46.46 ± 16.5 to 53.73 ± 18.5). Furthermore, this study has shown that mean PEFR may be used to classify severity of airway obstruction in both asthma and COPD with no significant difference with FEV<sub>1</sub>, except in mild asthma and severe COPD. Therefore, this study has shown that PEFR may be used in the clinics to help differentiate between asthma and COPD and for following-up their response to treatment. Additionally, PEFR can classify the severity of airway obstruction among asthmatics and COPD patients. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp: 21-27.

## **THE EFFECT OF PASSIVE SMOKING ON THE RESPIRATORY HEALTH AND PULMONARY FUNCTION OF CHILDREN**

By: Charito J. Carbon MD, Milagros S. Bautista, MD, FPCCP,  
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The health hazards attributable to environmental tobacco smoke exposure have been extensively reviewed in recent years. In the local setting, the effect of passive smoking on the pulmonary function of children has been less well investigated. Hence, this study was undertaken to establish the association of passive smoking with the respiratory health and pulmonary function of schoolchildren.

The study was conducted in an elementary public school consisting of 2,158 students in Rizal Province from September 16 – October 1, 1999. A total of 2,024 consent letters with health questionnaires on childhood respiratory symptoms were distributed. A total of 1,684 schoolchildren answered the respiratory health questionnaire. One thousand and ninety children (66.14%) had exposure to passive smoking at home; while 558 (33.86%) had no exposure to passive smoking.

The positive exposure group had higher prevalence rate of respiratory illness / symptoms at 73.76% as compared with the negative exposure group at 66.49%, and this was statistically significant. In the positive exposure group, runny/congested nose had the highest prevalence (64.14%), followed by day/night cough (33.21%), phlegm (28.62%), cough and phlegm (26.06%) and morning cough (21.38%). Doctor diagnosed asthma ranked sixth at 14.22%. Morning cough (25.14%) and shortness of breath (11.32%) were most prevalent when parent/s and others were the source of passive smoking. Day/night cough (46.15%), chronic cough (11.54%), wheeze (15.38%), runny/congested nose (76.92%), doctor diagnosed pneumonia (7.69%), cough (19.23%) and cough and phlegm (38.46%) were highest in the both parents group. When the mother was the only source of passive smoking, doctor diagnosed asthma (23.08%), doctor diagnosed bronchitis (15.38%) and phlegm (38.46%) were the most prevalent. However, day/night cough, congested/runny nose, doctor diagnosed asthma and bronchitis, and phlegm were statistically significant. The pulmonary function of the positive exposure group, particularly FEV<sub>1</sub>, FEF<sub>50</sub>, and PEF<sub>R</sub>, were lower compared with the negative exposure group. FEV<sub>1</sub>, FVC, FEF<sub>50</sub>, and FEF<sub>25</sub> were lowest when the mother was the only source of passive smoking; the lowest PEF<sub>R</sub> was seen in the parent/s and others group. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp: 28-34.

## **PULMONARY FUNCTION TEST OF SCHOOLCHILDREN EXPOSED TO INCREASING LEVELS OF AIR POLLUTION**

By: Mary Ann B. Cruz, M.D., Charito B. Carbon, M.D., Nerissa Atienza-De Leon, M.D.  
Milagros S. Bautista, M.D., FPCCP, Teresita S. De Guia, M.D., FPCCP,  
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Exposure to air pollution has been reported to adversely affect respiratory health during childhood. Elevated levels of particulate pollution has been associated with increased incidence of respiratory symptoms, decreased pulmonary function, increased hospitalization for respiratory disease and increased mortality. This study was therefore undertaken to examine the potential association between air pollution and respiratory health among schoolchildren in the local setting. Spirometries of children studying in schools lying in progressively outward radii from a cement factory were done. Of the 637 schoolchildren screened only 333 (52.3%) were included in the study.

Comparing the 3 radii, radius 2 has the highest prevalence rate of respiratory illnesses and symptoms followed by radius 3 then radius 1 ( $p=0.000$ ). The prevalence of lung function abnormality (mild restriction) was highest in radius 1 which was 30.8% and lowest in radius 3 at 18.4% but was not statistically significant ( $p=0.21$ ). Comparing the mean  $FEV_1$  in the 3 radii, it was highest on radius 3, this was not statistically significant with  $p=0.07$ . In conclusion, this study provides evidence that rates of respiratory illness and symptoms decrease with increasing distance from the source of air pollution. On the other hand, prevalence in lung function abnormality decreases with the increasing distance from the source of air pollution. However, a longitudinal study is recommended to provide additional information about the long-term effects of these pollution exposures. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp: 35-39.



## **A RANDOMIZED CONTROLLED TRIAL ON THE LONG-TERM EFFECTS OF MULTIPLE EXPOSURES TO PULMONARY REHABILITATION ON STABLE COPD PATIENTS**

By: Lenora Fernandez, M.D., FPCCP, Jubert Benedicto, M.D.,  
Ma. Bella Siasoco, M.D., FPCCP, Buenaventura Medina, Jr., M.D.

**Objective:** To determine the effects of a four-week pulmonary rehabilitation program with reinforcement sessions done every other month on the pulmonary function tests, functional capacity, and quality of life of patients with stable COPD with one year of follow-up.

**Design:** Randomized, double-blind controlled trial (prospective).

**Setting:** The Chronic Ambulatory Respiratory Rehabilitation (CARE) Program of the Philippine General Hospital.

**Patients:** Patients with stable (no acute infections, no increase medications required, no exacerbation which warranted medical consult for the past two weeks) COPD ( $FEV_1 / FVC$  and  $FEV_1$  less than 70% of predicted) who were less than 75 years old.

**Main Outcome Measured:** Outcome measures were evaluated upon entry into the study, on the first month or immediately after the four-week pulmonary rehabilitation program, and on the sixth and twelfth month after entry into the study. The post-bronchodilator  $FEV_1$ , and FVC were measured, the functional capacity was assessed with the six-minute walk test, and the quality of life was evaluated as reflected by mortality, number of emergency room consult, and quality of life score using the Guyatt's Chronic Respiratory Disease Questionnaire.

**Result:** A total of 78 patients were initially randomized into the study with 56 subjects subsequently evaluated. There were a total six mortalities with each group accounting for three each. The addition of reinforcement sessions did not have any significant effects on the physiologic parameter measured, exercise endurance, and the dyspnea and fatigue dimensions of the CRQ. The quality-of-life score in the mastery dimension was significantly higher for those who underwent reinforcement sessions ( $p=0.028$ ).

**Conclusion:** Pulmonary rehabilitation significantly improved exercise endurance and quality of life among patients with COPD in a sustained manner for one year. Exposure to once-every-other-month reinforcement sessions only significantly improved the mastery dimension of their quality of life. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp: 40-45.

**SURVIVAL OF PATIENTS IN THE LCP HOME OXYGEN PROGRAM:  
A Preliminary Report**

By: Eileen G. Aniceto, MD, FPCCP, Norberto A. Francisco, MD, FPCCP,  
and Raymund P. Fernandez, MD

A retrospective review of the 61 patients in the Lung Center of the Philippines (LCP) Home Oxygen Program (HOP) was done to evaluate their survival. Included in this long-term oxygen program (LTOP) were patients not only with COPD, but those with bronchiectasis, PTB, kyphoscoliosis and interstitial lung diseases as well. The age and sex of the studied population were comparable. However, the pCO<sub>2</sub> level as well as the level of continuous O<sub>2</sub> requirement did not affect survival significantly. Nearly half (45.90%) of those enrolled remained alive after one year, but only 6.56% survived after two years. By the end of the third year, only 3.28% have remained alive. No significant predictors of survival were identified in this study using univariate and multivariate analyses. *Phil. Journal Chest Diseases*. Vol. 7 No. 1 pp: 46-51.

**A COMPARATIVE STUDY OF PATIENTS WITH AND WITHOUT  
OBSTRUCTIVE SLEEP APNEA SYNDROME  
AT ST. LUKE'S MEDICAL CENTER**

By: Marie Geraldine Lim, MD, Merci Gappi, MD, FPCCP

Introduction: Sleep disordered breathing is a common medical disorder that is associated with high morbidity and mortality risk.

Objective: To compare patients with and without obstructive sleep apnea at St., Luke's Medical Center.

Design: Retrospective, descriptive, analytical.

Method: All records of patients who underwent sleep studies at St. Luke's Medical Center from 1992 to October 19998 were reviewed. Excluded from the study, were patients who underwent sleep study for seizures. Demographic data, anthropometric data, presenting complaint, clinical presentation, social history, and co-morbid illnesses were compared.

Statistical Analysis: Continuous data were presented as means and the difference between the two groups were determined using *t* test. Categorical data were presented as frequencies and the difference between the two groups were determined using the *chi square test*. A significant *p* value was set a  $< 0.05$ . The likelihood ration and predictive values of the significant values were computed.

Results: 211 patients were included in the study. A total 125 patients were diagnosed to have OSAS while 86 belonged to the non-OSAS group. Of the patients with OSAS, 110 were male while 15 were female; with a mean age range of 47.3 years. For the OSAS group, the mean BMI was 32.8 kg/m<sup>2</sup> and the non-OSAS group was 24.9 with a  $p < 0.05$ . Mean neck circumference was 17.7 inches for those with OSAS while 16 inches for the non-OSAS group with a  $p < 0.05$ . The most common presenting complaint was snoring for both groups with a significant *p* value. The clinical presentation that had a significant *p* value were dozing while driving, dyspnea through the nose, habitual snoring, snoring that disturbs the bed partner, and snoring that awakens the patient from sleep. The co-morbid illness that had a  $p < 0.05$  was hypertension. Snoring had a likelihood ration (LR) of 162%, a predictive value (PV) of 70%; 74%; snoring that disturbs the bed partner had a LR of 164%, a PV of 70%; snoring that awakens the patient from sleep had a LR of 150%, a PV of 69%.

Conclusion: After comparing the two groups, patients with OSAS were most likely male, belonging to the older age group, obese, hypertensive, noted to dose while driving, complaints of dyspnea through the nose, habitual snorers, whose snoring disturbs the bed partner, and who are awakened from sleep by their snoring. Phil. Journal Chest Diseases. Vol. 7 No. 1 pp: 52-55

## **EVALUATION OF COR PULMONALE IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE USING ECHOCARDIOGRAPHY**

By: Marie Antoinette Reyes-Laman, M.D., Teresita De Guia, M.D., FPCCP

Pulmonary hemodynamics presents an important prognostic factor in patients affected by COPD. Early diagnosis using practical noninvasive methodology could help identify status and therefore possibly initiate more aggressive therapy. This study was therefore contemplated to examine the utility of echocardiography for such a purpose. A retrospective analytical study of 72 adult in-and outpatients diagnosed to have COPD, and had both PFT and echocardiography, at the Philippine Heart Center during an interval of 5 years was done. Spirometric parameters FEV<sub>1</sub>, FEV<sub>1</sub>/FVC ration and FVC were correlated with Doppler echocardiographic parameters suggestive of pulmonary hypertension (such as RA, RV and LV dimensions, character of septum, pulmonary artery pressure measurements using pulmonary acceleration time (PAT) and tricuspid regurgitant jet (TRJ), presence of pulmonary regurgitation and reversal of E/A ration (velocities across MV), as well as deceleration time and interventricular relaxation time or IVRT). All parameters have a  $p > 0.05$  and are labeled to be not significant except for LV dimension which has a  $p < 0.036$  (significant). However, most of the patients with elevated LV dimensions were noted to be hypertensive and with coronary artery disease. It is therefore recommended that further larger studies be made to examine this problem. Various methods of pulmonary artery pressure estimations (TRJ, RVET, PAT, etc.) should be utilized and exercise-induced Doppler echocardiography could be included to identify those in the early stage of Cor Pulmonale. Phil. Journal Chest Diseases. Vol. 7 No. 1 pp: 56-62.