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Correlation of Global Body Examination (GBE) and St. George's Respiratory Questionnaire (SGRQ) in Patients with Chronic Obstructive Pulmonary Disorder (COPD)

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***Abstract*— Background and purpose: Chronic Obstructive pulmonary Disease (COPD), a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. A new comprehensive instrument the Global Body Examination (GBE) is developed. It is an improved evaluation tool for respiration extracting from CBE and GPE-52 the respiration items with best ability to assess a patient with respiratory disorders. It has been earlier documented that GBE have good internal consistency and is excellent in discriminating healthy individual and patient with respiratory disorder. The new scales provide a sound basis for physiotherapeutic examination of patients with long-lasting Respiratory problems. Finding relationship of GBE with other measures of respiratory functions still remains unexplored. The present study aims towards finding out the relationship of GBE with SGRQ in COPD patients.**

Methodology: It was a correlational study design which includes 22 COPD male Subjects of age between 40-65 years already diagnosed with COPD patients in the study. . The subjects were randomly divided into two groups of (Group I, n=11, Group II, n=11), measurements of SGRQ and GBE were documented.

Results: There was a good correlation found between the Global Body Examination and St. George's Respiratory Questionnaire (r = 0.910, p = .0001).

***Index Terms*— Correlation of Global Body Examination (GBE) and St. George's Respiratory Questionnaire (SGRQ) in patients with Chronic Obstructive Pulmonary Disorder (COPD).**

I. INTRODUCTION

Highlight Chronic Obstructive pulmonary Disease (COPD), a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. (1) COPD is a leading cause of morbidity and mortality worldwide as a result and results in an economic and social burden that is both substantial and increasing. The prevalence of COPD is directly related to the prevalence of tobacco smoking outdoor occupational and indoor air pollution. (2) Most studies showed that COPD prevalence and mortality were greater among men than women but data from developed countries. Lung hyperinflation is an important physiologic abnormality in patients with COPD which increases the operating lung volumes and places inspiratory muscles at a mechanical disadvantage, contributing to the occurring of dyspnea and limiting exercise capacity in patients. (3) Modified British Medical Research Council (mMRC) Questionnaire for breathlessness measurement relates well to other measures of health status and predicts future mortality risk (4). Health status measurements such as that provided by the St George's Respiratory Questionnaire (SGRQ) and the Chronic Respiratory Questionnaire (CRQ) provide well validated measurements of disability and handicap due to COPD. Clinical COPD Questionnaire (CCQ) is a self-administered questionnaire specially developed to measure clinical control in patients with COPD. The world health organization recommends that COPD patients from areas with a particular high prevalence of alpha-1 antitrypsin deficiency should be screened for this genetic disorder. Objectively measured exercise impairment, assessed by a reduction in self-paced walking distance or during incremental exercise testing in a laboratory (5), is a powerful indicator of health status impairment and predictor of prognosis. The BODE method gives a composite score (Body mass index, Obstruction, Dyspnea and exercise) that is better predictor of subsequent survival than any component singly. Several body examinations have been developed to guide physiotherapeutic interventions. Three of these have been refined by quantitative research: the Comprehensive Body Examination (CBE) the Global Physiotherapy Examination-52 (GPE-52) and the Resource Oriented Body Examination II (ROBE II) (6). A new comprehensive instrument the Global Body Examination (GBE) is developed. It is an improved evaluation tool for respiration extracting from CBE and GPE-52 the respiration items with best ability to assess a patient with respiratory disorders. Most of the scales which assess COPD are subjective questionnaires, imaging, pathological tests or pulmonary function test. GBE developed from CBE and GPE-52 has

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been identified an useful tool to evaluate Musculoskeletal abnormalities of thorax and lower coastal regions in Respiratory disorders such as Chronic Asthma, COPD etc. It has been earlier documented that GBE have good internal consistency and is excellent in discriminating healthy individual and patient with respiratory disorder. The new scales provide a sound basis for physiotherapeutic examination of patients with long-lasting Respiratory problems. Finding relationship of GBE with other measures of respiratory functions still remains unexplored. The present study aims towards finding out the relationship of GBE with SGRQ in COPD patients.

II. Methodology

It was a correlational study design which includes 22 COPD male Subjects of age between 40-65 years already diagnosed with COPD patients in the study. Exclusion criterion includes COPD patients with any other comorbidities, Patient with any other cardio respiratory, neurological condition, Systemic condition and musculoskeletal abnormalities. All participants signed the consent form before any data collection and experimental procedure were explained to each subject both verbally and in writing. The subjects were randomly divided into two groups of (Group I, n=11, Group II, n=11), measurements of SGRQ and GBE were documented. Following which Group 1 is first evaluated by the subjective tool SGRQ questionnaire and Group 2 is evaluated by the objective tool and then Group 1 subjects are evaluated by GBE and Group 2 subjects are evaluated by SGRQ questionnaire. This is a cross over design method of study to reduce the bias and type 2 error. GBE Protocol was approved by institutional ethical committee. All subjects are assessed by both tools SGRQ and GBE. Initially all the patients were assessed by a subjective tool SGRQ Questionnaire. The SGRQ questionnaire were individually handed out to each patient , a short explanation of the aims of the research and the instructions for compiling the questionnaire were given to all the subjects and requesting to fill in the questionnaire at the spot with their respective answers. Then all the patients were assessed by the second observational tool GBE. The participants were examined in without upper body clothes, individuals can breathe as usual when they are aware that therapist is evaluating the respiration. The respiration is observed while examining posture, and very few seemed to realize that respiration also was inspected. All individuals were examined on the same day when evaluated with SGRQ.

A. Assessment with GBE

The Respiration domain of the GBE has 20 items in three Subscales: Position of thorax (Four items), Tension (Six items), and Respiratory Movements (Six items). Position of thorax: Position of thorax consider inspiration position or expiration position of the thorax i.e. (degree of flat or round thorax), this scale measures to what extent the examined person has an inspiration or expiration formed thorax. This subscale revealed considerable variation among the most severely ill patients. Thorax position is inspected in standing; first seen from the left side, partly from the front, then partly from the back. Seen in the coronal plane the diameter shall be about equal on the ventral and dorsal side. Thorax can be divided to four quadrants; inspect and score one at the time: 1st to 6th costal ventrally, 6th to 12th costal ventrally, 1st to 6th costal dorsally and 6st to 12th costal dorsally.

B. Respiratory movement

Respiration is usually examined parallel with the other examination without the person knowing, because respiration alters when the person is thinking about it. The observations are taken from the left side of the patient and obliquely over to the front of patient. Observe one area at the time. The movement shall be obvious; more in supine than in standing. Respiratory movement can be observed in 3 zones both in standing and in supine position: Hypogastrium medial standing, Epigastrium lateral standing, Low costal lateral standing, Hypogastrium medial supine, Epigastrium lateral supine, and Low costal lateral supine.

C. Tension

Tension, represent sign of visible tension in the thoracic function respiration and respiratory movement, comprises items measuring active expiration, as well as constrictions in the abdominal and lower intercostal soft tissue and dysrhythmic respiration. Tension can be observed in three domains in both standing and supine position. All domains have different pattern for scoring. Tension can be observed in following domains namely Rhythm is evaluated for the whole bellow, Constriction of the expiration muscles or drawn in areas, and Contraction of the expiration muscles in standing.

D. SGRQ Assessment

The SGRQ measures health impairment in COPD patients. It is in two parts. Part I produces the Symptoms score, and Part 2 the Activity and Impacts scores. A Total score is also produced.

III. Data Analysis

The data was analyzed using SPSS version 21.00 software. Spearman's rho coefficient of correlation test was used to find out the correlation between The Global Body Examination and the St. George's Respiratory Questionnaire. The correlation coefficient is denoted by *r*, which is a measure of the strength of the straight line or linear relationship between two variables.

IV. Results

A total of 22 subjects with COPD participated in the study Completed both evaluations GBR and SGRQ. The mean age of the participants was 54.40 $\pm$ 7.782 years (range 40-65) mean height of subjects was 165.95 $\pm$ 2.874 cm and their mean weight was 63.40 $\pm$ 4.672 Kgs.

Table no.1 Demographic data

Variables	Mean ± SD
Age (Years)	54.40 ± 7.782
Height (Centimeters)	165.95 ± 2.874
Weight (Kgs)	63.40 ± 4.672

Global Body Examination (GBE)

Global Body Examination observations (GBE) revealed severe COPD in most of the patients, mean GBE was 1.55 ± .6575 of predictive value (range 9 to 51).

St. George's Respiratory Questionnaire (SGRQ)

St. George's Respiratory Questionnaire (SGRQ) showed severe health impairment in COPD patients, mean SGRQ was (53.26 ± 12.8026) of predictive value (range 30.92- 75.28).

Correlation between the Global Body Examination (GBE) and St. George's Respiratory Questionnaire (SGRQ)

SGRQ Mean ± SD	GBE Mean ± SD	Spearman's rho Coefficient (*r*)	*p* Value
53.26 ± 12.8026	1.55 ± .6575	0.910	.0001

There was a good correlation between the Global Body Examination and St. George's Respiratory Questionnaire ($r = 0.910$, $p = .0001$) [Figure no.1]. The mean GBE was (1.55 ± .6575) and the mean SGRQ was (53.26 ± 12.8026). Spearman's rho correlation coefficient for calculation was fitted to this model. On analysis the result showed significant correlation between GBE and SGRQ.

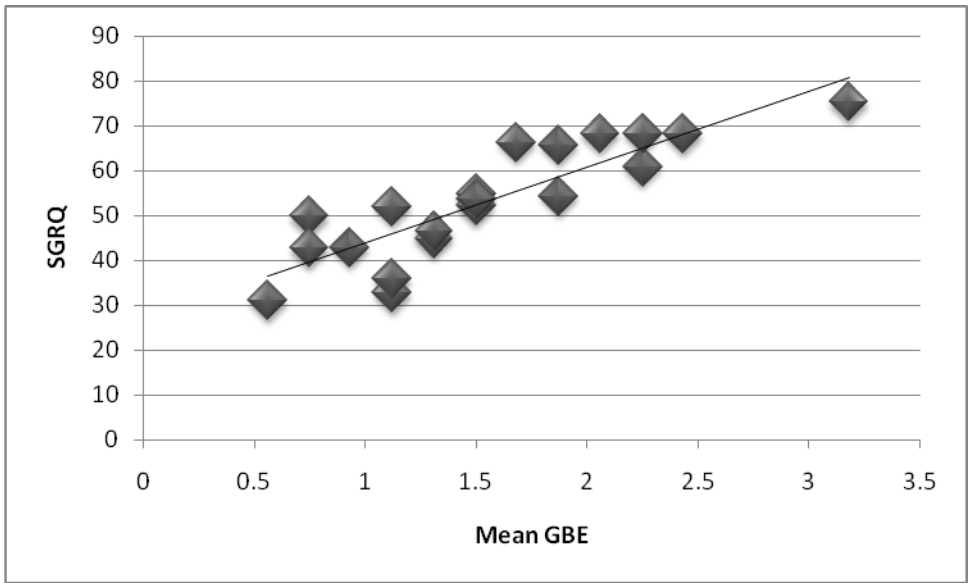

Figure 1: Correlation between GBE and SGRQ

V. Discussion

This study has shown that the findings of Global Body Examinations have a positive association with the findings in SGRQ. This study also shown that The Global Body Examination tool can assess the status of musculoskeletal impairments occur in Thorax region and Respiratory muscles in patients with COPD The first subscale, **Tension** comprises items measuring active expiration, as well as constrictions in the abdominal and lower intercostal soft tissue and dysrhythmic respiration. When respiration muscles work both during inspiration and expiration, the resting phase is reduced. Unnecessary energy is used and the individual often gets tired.

Constant contractions of the expiration muscles often lead to short, hard muscles. The second subscale, **Position of thorax**, this scale measures to what extent the examined person has an inspiration or expiration formed thorax (6). This subscale revealed considerable variation among the most severely ill patients. The third subscale, **Respiration movements**, measures degree of abdominal and low costal movements, which are important for the function of the bottom of the pelvic and the function of the internal organs. This subscale also measures the basolateral movements of the

thorax, which is important in unhampered thoracic movements. This subscale is important, as clinical experience indicates that the basal respiration movements influence general tension and circulation in the back, hips, internal organs, and also pain in the same areas and are important in controlling emotions. In modern medicine, the traditional method of assessing change among patients has been to focus on laboratory or clinical tests these give important information about the disease. GBE is a new instrument for evaluation of respiration. The subscales and sum-scores have good internal consistency; discriminate excellently between healthy individuals and patients. The new scales provide a sound basis for physiotherapeutic examination of patients with long-lasting respiratory problems, The subscales can also be useful in examination of patients with other lung diseases (asthma, etc), as these patients have varying degrees of affected respiratory movements, constrictions and contractions in the expiratory muscles. Systematic evaluation may help tailoring more specific interventions, and help documenting change in respiration over time.

There is a need to future explore the relationship between GBE subscale scores and other measures of respiratory function to ensure it as a more valid and reliable tool for manually respiratory assessment by a physiotherapist in his clinical practice . Further studies to confirm its clinical utility, its validity and reliability are warranted. A longitudinal investigation might have helped to discriminate between state and trait aspects of respiration. Furthermore, the reliability must be examined in future studies.

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