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STUDY of TRANSFER FACTOR, FVC AND 6MWT IN PATIENTS WITH SEVERE COPD IN A SUPERSPECIALTY HOSPITAL

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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a disease with widely spread clinical presentations, the shared abnormality being airflow limitations. It is defined as "a preventable and treatable disease with some significant extra pulmonary effects that may contribute to the severity in individual patients. Its pulmonary component is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases".

Forced expiratory volume in 1sec (FEV1) is used to determine disease severity in COPD and traditionally formed the basic of different classification systems. Quantification of disease severity based on FEV1 undoubtedly has the advantage of simplicity. However FEV1 do not fully describe other important pathophysiological changes of the pulmonary tract such as (dynamic) hyperinflation and gas exchange abnormalities.

❖ **SEVERE COPD**: FEV1\FVC < 70% and FEV1 < 50% predicted and >_ 30% predicted. With or without chronic symptoms (cough, sputum production) **Severe** COPD almost always has a noticeable impact on your quality of life. Breathing function continues to decline. Symptoms worsen; you'll feel tired more often and have less capacity for exercise. In terms of treatment, you may need a steroid inhaler to help prevent symptoms from worsening.

- **COPD COMORBIDITIES**

COPD patients are at increased risk for:

- Cardiovascular diseases
- Osteoporosis
- Respiratory infections
- Anxiety and Depression
- Lung cancer
- Bronchiectasis

❖ **FEV_1:** Forced Expiratory Volume in the first second. The volume of air that can be forced out in one second after taking a deep breath, an important measure of pulmonary function.

❖ **FVC:** Force vital capacity is the amount of air which can be forcibly exhaled from the lungs after taking the deepest breath possible. FVC is used to help determine both the presence and severity of lung diseases.

❖ **TRANSFER FACTOR**

D_{LCO} is decreased in any condition which affects the effective alveolar surface area

1. Hindrance in the alveolar wall.
2. Decrease of total lung area,
3. Chronic obstructive pulmonary disease (COPD) due to decreased surface area in the alveoli, as well as damage to the capillary bed
4. Pulmonary embolism
5. Cardiac insufficiency
6. Pulmonary hypertension
7. Bleomycin (upon administration of more than 200 units)
8. Chronic heart failure
9. Anemia-due to decrease in blood volume
10. Amiodarone high cumulative dose; more than 400 milligrams per day

❖ **TECHNICAL ASPECTS OF THE 6MWT**

The 6MWT (6 minutes walking Test) should be performed in indoors, along a long, flat and straight path. The walking course must be 30 m in length. A 100-ft corridor is, therefore, required. The length of the corridor should be marked every 3 m. A starting line, which marks the beginning and end of each 60-m lap, should be marked on the floor using brightly colored tape. A shorter corridor requires patients to take more time to reverse directions more often, reducing the 6MWD. The use of a treadmill to determine the 6MWD might save

space and allow constant monitoring during the exercise, but normally this test is handling by a technician.

Mainly we look Heart Rate, SPO2, Distance and Desaturation in this test. Every minute up to 6 minute we note the value of HR, SPO2 and DISTANCE, for this test need:

- A note book,
- A pen,
- A stop watch and
- A pulse oximeter.

AIM AND OBJECTIVE OF THE STUDY

1. To look for degree of desaturation and 6 Minute Walk Distance in patients of stable severe COPD.
2. To look for DLCO value in case of severe COPD.

METHODOLOGY

❖ ***STUDY POPULATION***

29 patients for pulmonary OPD, Fortis Hospital who have severe COPD according to GOLD Spiro.

❖ ***INCLUSION CRITERIA***

1. Severe COPD,
2. Age,
3. Only OPD patient.

❖ ***EXCLUSION CRITERIA***

1. Severe COPD who are bed ridden,
2. Severe COPD who cannot walk.

❖ ***METHOD***

Patients with COPD participated in this study. Outcome measure was exercise capacity (6MWT), pulmonary function test. This project's name is ***TRANSFER FACTOR, FVC AND 6MWT in pts with SEVERE COPD.*** My study was conducted in the Fortis Hospital (Anandapur). Hospital institutional review board approval was granted for this study.

I conducted this study under the guidance of Dr. Santu Kr. Samanta, For this study I take 29 cases in Fortis Hospital, Anandapur, Kolkata. I examined 29 patients with respiratory diseases.

❖ ***DURATION OF THE STUDY:*** The project report was done from April 2017 to July 2017 on 15, in patients in Respiratory ward of Fortis Hospital Anandapur.

❖ ***STUDY PLACE:*** OPD, Fortis Hospital, Anandapur.

❖ ***STUDY DESIGN:*** This was a cross – sectional observational study.

❖ ***STUDY TOOLS:*** Spirometry, Pulse oximeter.

PATIENT ID	AGE	SEX	SMOKING HISTORY	FVC(%)		FEV1(%)	DLCO		FEV1/FVC(POST)	6MWT	
				pre	*post*	*POST*	*patient value*	*% predicted*	*% predicted*	*desaturate*	*distance*
193345	66	M	never	65	67	41	_	_	62	no	400mtrs
39	80	M	_	37	50	34	_	_	67	no	350mtrs
94002	68	M	never	51	57	36	_	_	62	no	475mtrs
213427	73	M	quit(pack year-10)	62	64	42	_	_	65	no	350mtrs
125885	75	M	yes(pack year-7)	43	51	40	_	_	77	yes	200mtrs
32364	54	M	quit(pack year-6)	44	51	37	_	_	53	yes	475mtrs
219113	75	M	quit(pack year-9)	50	50	34	_	_	66	yes	400mtrs
220239	66	M	smokes(pack year-15)	52	52	35	_	_	67	yes	400mtrs
220292	56	M	smokes(pack year-26)	57	63	47	_	_	76	no	400mtrs
220776	58	M	never	52	53	39	_	_	37	no	375mtrs
208045	72	M	quit(pack year-10)	49	53	38	_	_	70	yes	300mtrs
5735	67	M	quit(pack year-60)	72	79	48	_	_	60	yes	350mtrs
131575	69	F	never	37	43	34	_	_	77	yes	100mtrs
203045	67	M	quit(pack year-5)	58	68	31	_	_	46	yes	350mtrs
144935	66	M	never	39	40	31	_	_	77	yes	325mtrs
7805	75	M	quit(pack year-15)	58	63	39	_	_	60	yes	375mtrs
198998	70	M	quit	56	46	49	_	_	76	no	325mtrs
169929	67	M	never	69	67	40	_	_	60	no	400mtrs
80841	67	M	quit(pack year-60)	51	57	30	_	_	53	no	325mtrs
206770	63	M	quit(pack year-10)	46	49	36	_	_	54	yes	400mtrs
209726	70	M	quit(pack year-45)	48	49	40	_	_	70	no	325mtrs
131911	76	M	quit(pack year-7.50)	48	55	45	_	_	80	yes	350mtrs
218978	75	M	quit(pack year-15)	73	78	36	_	_	46	yes	300mtrs
215955	55	M	never	42	40	42	_	_	42	yes	325mtrs
30836	70	M	never	62	69	34	_	_	50	yes	350mtrs
221076	60	M	never	56	65	33	_	_	50	yes	425mtrs
211219	66	M	smokes(pack year-20)	62	59	37	_	_	63	no	375mtrs
137085	69	M	never	69	69	40	_	_	58	yes	375mtrs
212958	72	M	never	44	48	31	_	_	65	no	375mtrs

TABLE OF COLLECTED DATA

Transfer Factor with FVC in pts in severe COPD

Demographic Characteristics

	No. (%)
Sex	
Male	28 (96.55%)
Female	1 (3.45%)
Whether Smokes	
Smoker / Quit	17 (58.62%)
Non Smoker	12 (41.38%)

Pack years for Smoker / Quit smoke group (Mean ± SD) 22.69 ± 20.19 Years

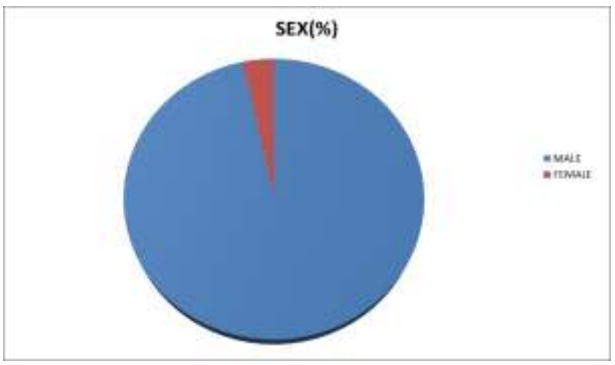
	Mean ± SD
Age (Years)	67.83 ± 6.64
FVC (pre)	54.21% ± 11.29%
FVC (post)	58.34% ± 10.85%
FEV1 (post)	36.86% ± 7.78%
FEV1 / FVC (post)	61.69% ± 11.67%

6 minute walk test

De-saturation	No. (%)	17 (58.62%)
Distance (meter)	Mean ± SD	354.31 ± 73.89

MALE AND FEMALE PATIENTS (%)

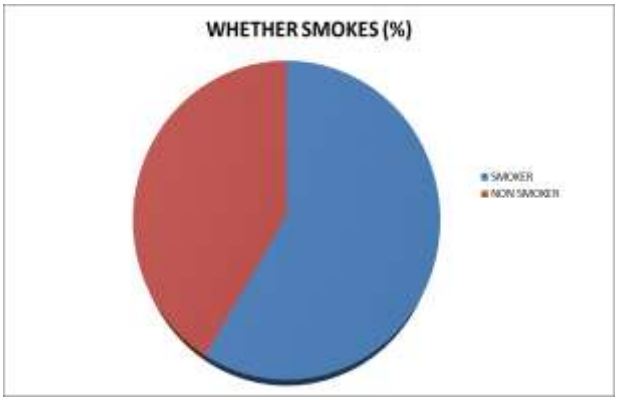
	No. (%)
Sex	
Male	28 (96.55%)
Female	1 (3.45%)



The number of male patients who are suffering to Severe COPD is greater than female patient.

SMOKER AND NON SMOKER (%)

Whether Smokes	
Smoker / Quit	17 (58.62%)
Non Smoker	12 (41.38%)



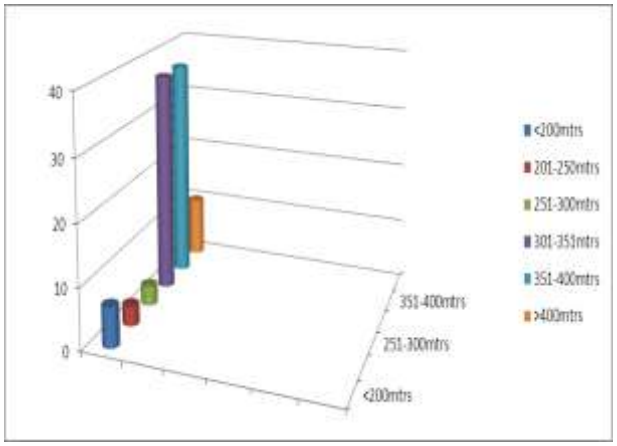
The number of smoker or ex-smoker patients who are suffering to severe COPD is greater than non-smoker patient.

DATA ANALYSIS

6MWD (6 minute walk distances)

<\= 200 meters : 2(6.89%)
201 - 250 meters : 1(3.45%)
251 – 300 meters : 1(3.45%)
301 – 350 meters : 11(37.93%)
351 – 400 meters : 11(37.93%)
>400 meters : 3(10.34%)

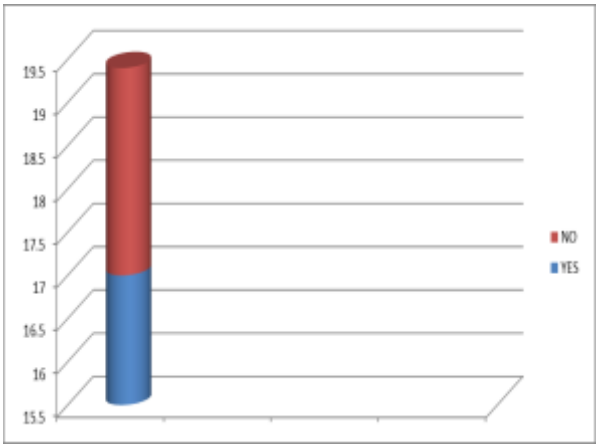
COLUMN CHART



Here we looking that distance between (301-350mtrs) and (351-400mtrs) is higher and equal also, the no of patients is 22(75.86%) in this distance.
>400mtrs has 3(10.34%) patients.
<200mtrs has 2(6.89%) patients.
201-250 mtrs has only 1(3.45%) patient.

DESATURATION (%)

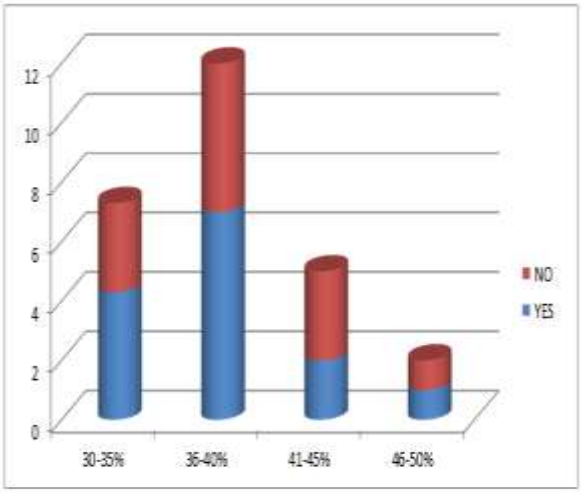
DESATURATION	NO OF PATIENTS	(%)
YES	17	58.62
NO	12	41.38



In 6MWT, DE saturated patients are greater than saturated patients.

FEV1 GREATTING AND DESATURATION

SPIROMETRY		DESATURATION	
FEV1(greatting)		YES	NO
30 - 35%		7	3
36 - 40%		7	5
41 - 45%		2	3
46 - 50%		1	1

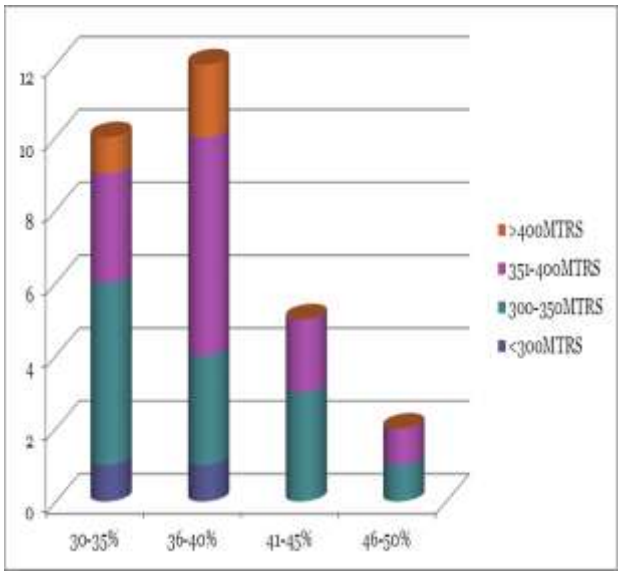


When FEV1 is 30-35% then the no of DE saturated patient is – 7, out of 10 patients. (10%)
When FEV1 is 36-40% then the no of DE saturated patient is – 7, out of 12 patients. (58.33%)
When FEV1 is 41-45% then the no of DE saturated patient is – 2, out of 5 patients. (40%)
When FEV1 is 46-50% then the no of DE saturated patient is – 1, out of 2 patients. (50%).

So here we looking, when FEV1 (%) is decreasing then desaturation increasing. So it is opposite relation between FEV1 and Desaturation.

FEV1 AND 6MWT

SPIROMETRY		6 M W T			
FEV1 grating		<300mtrs	300-350mtrs	351-400mtrs	>400mtrs
30 - 35%		1	5	3	1
36 - 40%		1	3	6	2
41 - 45%		0	3	2	0
46 - 50%		0	1	1	0



- In case of patient FEV1-30-35% about 6 out of 10(60%) to 6mwt <350mtrs; and 4 out of 10(40%) to 6mwt >350mtrs.
- In case of patient FEV1-36-40% about 4 out of 12(33.33%) to 6mwt <350mtrs; and 8 out of 12(50%) to 6mwt >350mtrs.
- In case of patient FEV1-41-45% about 3 out of 5(60%) to 6mwt <350mtrs; and 2 out of 5(40%) to 6mwt >350mtrs.
- In case of patient FEV1-46-50% about 1 out of 2(50%) to 6mwt <350mtrs; and 1 out of 2(50%) to 6mwt >350mtrs.

DISCUSSION

The following cases, patients are suffering from respiratory diseases leads to severe COPD.

- The number of male patients who are suffering to Severe COPD is greater than female patient.
- The number of smoker or ex-smoker patients who are suffering to severe COPD is greater than non-smoker patients.

- **6MWD** - Here we looking that distance between (301-350mtrs) and (351-400mtrs) is higher and equal also, the no of patients is 22(75.86%) in this distance.

>400mtrs has 3(10.34%) patients.
<200mtrs has 2(6.89%) patients.
201-250 meters has only 1(3.45%) patient.

- In 6MWT, DE saturated patients are greater than saturated patients

- **FEV1 AND DESATURATION**

When FEV1 is 30-35% then the no of DE saturated patient is – 7, out of 10 patients. (10%)
When FEV1 is 36-40% then the no of DE saturated patient is – 7, out of 12 patients. (58.33%)
When FEV1 is 41-45% then the no of DE saturated patient is – 2, out of 5 patients.(40%)
When FEV1 is 46-50% then the no of DE saturated patient is – 1, out of 2 patients. (50%)

So here we looking, when FEV1 (%) is decreasing then desaturation increasing it is opposite relation between FEV1 and Desaturation.

- **FEV1 AND 6MWT**

In case of patient FEV1-30-35% about 6 out of 10(60%) to 6mwt <350mtrs; and 4 out of 10(40%) to 6mwt >350mtrs.

In case of patient FEV1-36-40% about 4 out of 12(33.33%) to 6mwt <350mtrs; and 8 out of 12(50%) to 6mwt >350mtrs.

In case of patient FEV1-41-45% about 3 out of 5(60%) to 6mwt <350mtrs; and 2 out of 5(40%) to 6mwt >350mtrs.

In case of patient FEV1-46-50% about 1 out of 2(50%) to 6mwt <350mtrs; and 1 out of 2(50%) to 6mwt >350mtrs.

CONCLUSION

In our study the degree of FEV1 decrement is positively co-related with degree of Desaturation in 6MWT and negative co-relation with 6MWD.

❖ ***REFERENCES***

1. Wasserman K, Hansen JE, Sue DY, Casaburi R, Whipp BJ. Principles of exercise testing and interpretation, 3rd edition. Philadelphia: Lippincott, Williams & Wilkins; 1999. 116 AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE VOL 166 2002.
2. Weisman IM, Zeballos RJ. An integrated approach to the interpretation of cardiopulmonary exercise testing. Clin Chest Med, 1994; 15: 421–445.
3. Fletcher GF, Balady G, Froelicher VF, Hartley LH, Haskell WL, Pollock ML. Exercise standards: a statement for healthcare professionals from the American Heart Association: writing group. Circulation, 1995; 91: 580–615.
4. Pina IL, Balady GJ, Hanson P, Labovitz AJ, Madonna DW, Myers J. Guidelines for clinical exercise testing laboratories: a statement for healthcare professionals from the Committee on Exercise and Cardiac Rehabilitation, American Heart Association. Circulation, 1995; 91: 912–921.
5. Balke B. A simple field test for the assessment of physical fitness. CARI Report, 1963; 63: 18.
6. Cooper KH. A means of assessing maximal oxygen intake: correlation between field and treadmill testing. JAMA, 1968; 203: 201–204.
7. McGavin CR, Gupta SP, McHardy GJR. Twelve-minute walking test for assessing disability in chronic bronchitis. BMJ, 1976; 1: 822–823.
8. Butland RJA, Pang J, Gross ER, Woodcock AA, Geddes DM. Two-, six- and 12-minute walking tests in respiratory disease. BMJ, 1982; 284: 1607–1608.
9. Solway S, Brooks D, Lacasse Y, Thomas S. A qualitative systematic overview of the measurement properties of functional walk tests used in the cardiorespiratory domain. Chest, 2001; 119: 256–270.
10. Kadikar A, Maurer J, Kesten S. The six-minute walk test: a guide to assessment for lung transplantation. J Heart Lung Transplant, 1997; 16: 313–319.
11. Holden DA, Rice TW, Stelmach K, Meeker DP. Exercise testing, 6 min walk and stair climb in the evaluation of patients at high risk for pulmonary resection. Chest., 1992; 102: 1774–1779.
12. Sciurba FC, Rogers RM, Keenan RJ, Slivka WA, Gorcsan J 3rd, Ferson PF, Holbert JM, Brown ML, Landreneau RJ. Improvement in pulmonary function and elastic recoil after lung-reduction surgery for diffuse emphysema. N Engl J Med, 1996; 334: 1095–1099.