RESULTS

This study was conducted in Al-Mahalla Chest Hospital during period from December 2009 to April 2010. The study involved 60 subjects; their ages ranged between 40 to 68 years.

Table (1): Characteristic of subjects.

	Age				**BMI**			
	Mean ±SD	**t. test**	**p. value**		**Mean ±SD**	**t. test**	**p. value**	
Patients	56.04 ±7.14	2.325	0.663	NS	23.86 ±3.75	3.625	0.049	S
Control	49 ±4.42				26.50 ±5.40			

This table compare between COPD patients and control as regards age and BMI.

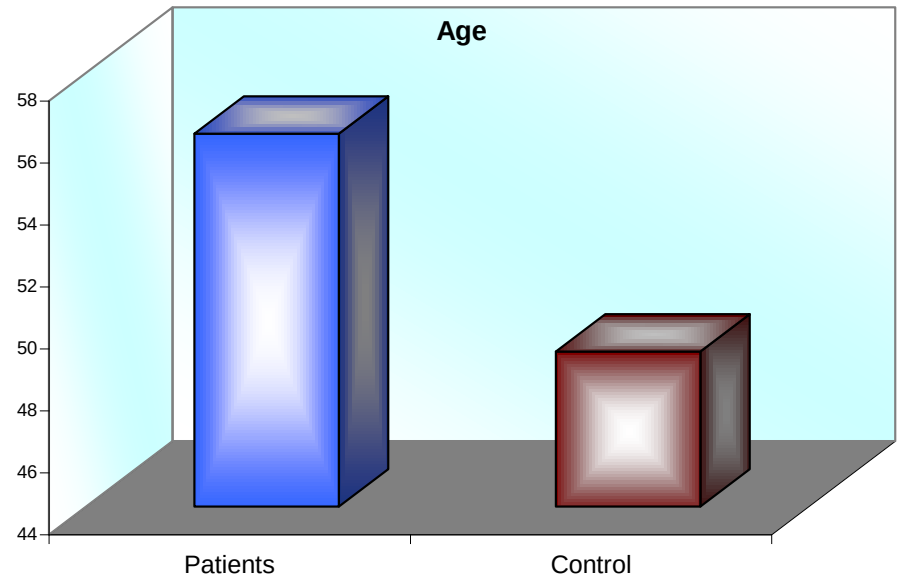

Fig. (2): In this figure there was no significant difference in age between COPD group and control group.

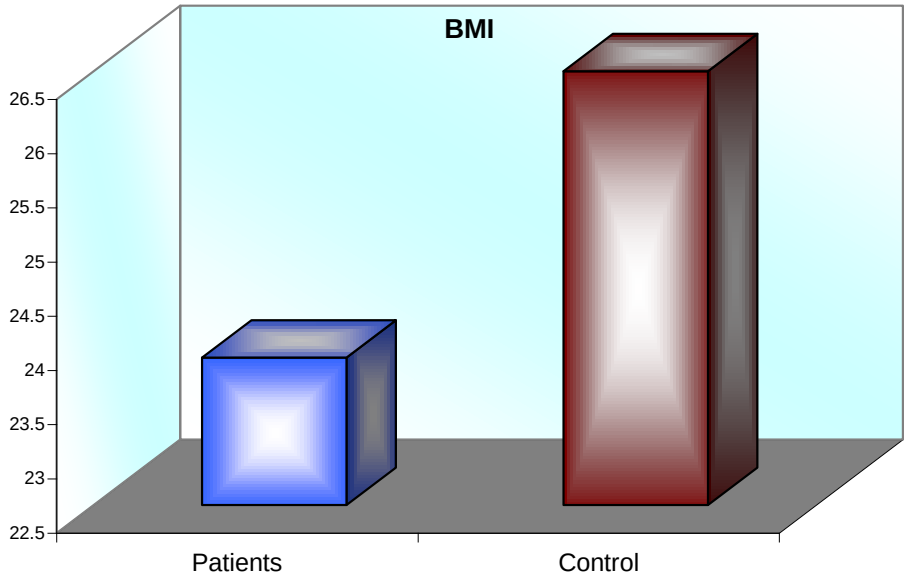

Fig. (3): In this figure there was significant difference in BMI between COPD group and control group.

Table (2):Clinical and radiological data among COPD groups.

Item	Moderate COPD	Severe COPD	Very severe COPD
Clinical data Cough n (%)	20 (100%)	22 (100%)	8 (100%)
Wheeze n (%)	15 (75%)	19 (86.3%)	8 (100%)
Exertional dyspnea n (%)	15 (75%)	20(90.9%)	8 (100%)
Evidence of core-pulmonale n (%)	5 (25%)	17(77%)	7 (87.5%)
X-ray findings Hyperinflation n (%)	10 (50 %)	10(45%)	5 (63%)
Dirty lungs n (%)	15 (75%)	12(55%)	3 (37%)
Isolated bullae n (%)	0	3 (14%)	1 (12%)

Table (3): Comparison between moderate COPD group and control group as regards ventilatory function tests(spirometry).

Item	Moderate COPD n=20 (mean ± SD)	Control n=10 (mean ± SD)	P-value	Significance
FVC/ Liter	2.96 ± 0.56	3.9 ± 0.91	0.055	NS
FVC% predicted	64 ± 5.88	85.66 ± 5.43	0.034	S
FEV_1 /Liter	1.81 ± 0.36	3.665 ± 0.79	0.021	S
FEV_1% predicted	58.75 ± 4.13	91.2 ± 3.54	0.000	HS
FEV_1/FVC	63.375 ± 2.45	94.2 ± 3.43	0.000	HS

Highly significant reduction in FEV_1%, FEV_1/FVC and only significant reduction in FVC% FEV_1/ Liter were detected in moderate COPD group in comparison with the control group.

Table (4): Comparison between severe COPD group and control group as regards ventilatory function tests(spirometry).

Item	Severe COPD n=22 (mean ± SD)	Control n=10 (mean ± SD)	P-value	Significance
FVC/ Liter	2.1 ± 0.63	3.9 ± 0.91	0.039	S
FVC%	54 ± 5.88	85.66 ± 5.43	0.000	HS
FEV_1/Liter	1.21± 0.66	3.665 ± 0.79	0.001	HS
FEV_1%	38.75 ± 6.13	91.2 ± 3.54	0.000	HS
FEV_1/FVC	41.675 ± 2.45	94.2 ± 3.43	0.000	HS

Highly significant reduction in FVC%, FEV_1/ Liter, FEV_1%, FEV_1/FVC and only significant reduction in FVC/ Liter were detected in COPD sever group in comparison with the control group.

Table (5): Comparison between very severe COPD group and control group as regards ventilatory function tests(spirometry).

Item	Very severe COPD n=8 (mean ± SD)	Control n=10 (mean ± SD)	P-value	Significance
FVC /Liter	1.63 ± 0.56	3.9 ± 0.91	0.039	S
FVC%	52± 5.88	85.66 ± 5.43	0.000	HS
FEV_1/Liter	0.95 ± 0.36	3.665 ± 0.79	0.001	HS
FEV_1%	22.75 ± 4.13	91.2 ± 3.54	0.000	HS
FEV_1/FVC	54.375 ± 2.45	94.2 ± 3.43	0.000	HS

Highly significant reduction in FVC%, FEV_1/ Liter, FEV_1%, FEV_1/FVC and only significant reduction in FVC/ Liter were detected in COPD very sever group in comparison with the control group.

Table (6): Comparison between total COPD group and control group as regards ventilatory function tests (spirometry).

Item	Total COPD n=50 (mean ± SD)	Control n=10 (mean ± SD)	P-value	Significance
FVC/ liter	2.8 ± 01.62	3.9 ± 0.91	0.178	NS
FVC%	63.25 ± 12.97	85.66 ± 5.43	0.05	S
FEV_1/liter	1.96 ± 0.97	3.665 ± 0.79	0.001	HS
FEV_1%	47.5 ± 24.51	91.2 ± 3.54	0.000	HS
FEV_1/FVC	61 ± 6.63	94.2 ± 3.43	0.000	HS

Highly significant reduction in FEV_1/litre, FEV_1% and FEV_1/FVC and only significant reduction in FVC% were detected in total COPD in comparison with the control group.

Table (7): Comparison between COPD groups and control group as regards number and percentage of normal,osteopenia and osteoporosis.

		COPD			
		Normal	**Osteopenia**	**Osteoporosis**	**Total**
Control	N	8	2	0	10
	%	80	20	0	
Moderate	n	7	9	4	20
	%	35	45	20	100
Severe	n	3	13	6	22
	%	13.6	59.1	27.3	100
very sever	n	0	5	3	8
	%	0	62.5	37.5	100
Total of COPD	n	10	27	13	50
	%	20	54	26	100

As regards BMD (represented by Tscore), osteopenia and osteoporosis frequency increases as degree of COPD passes from moderate to very severe.

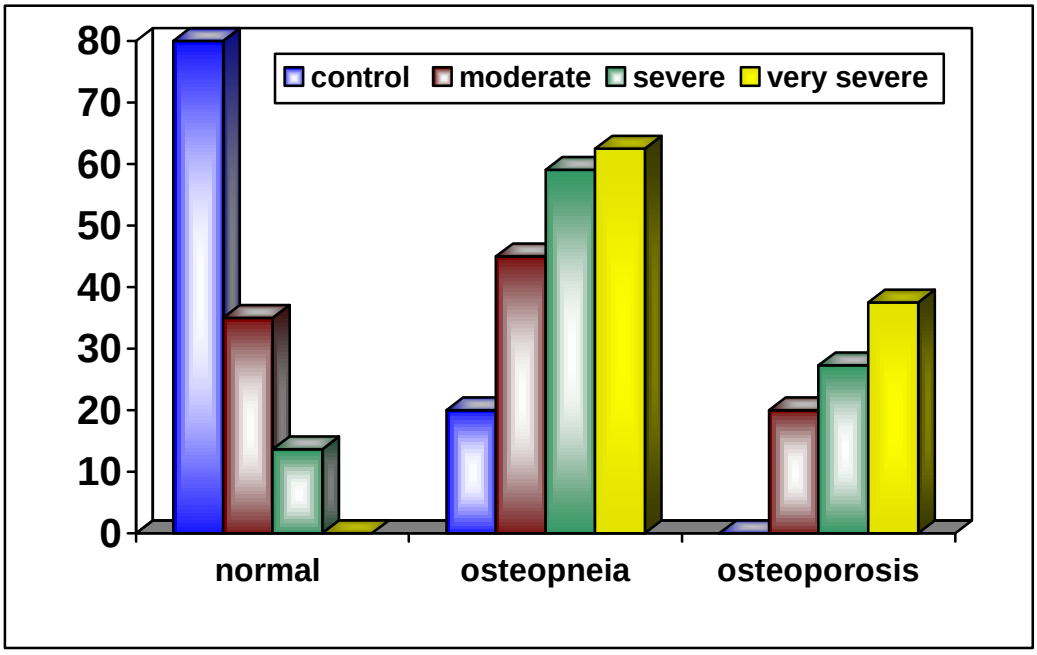

Fig. (4): Comparison between COPD subgroups and control group as regards number and percentage of normal, osteopenia and osteoporosis.

Table (8): Comparison between T score of COPD patients and control group.

	T score of patients	T score of control
Mean	-1.908	-0.11
±SD	0.325	0.02
t. test	16.80	
p. value	0.001* HS	

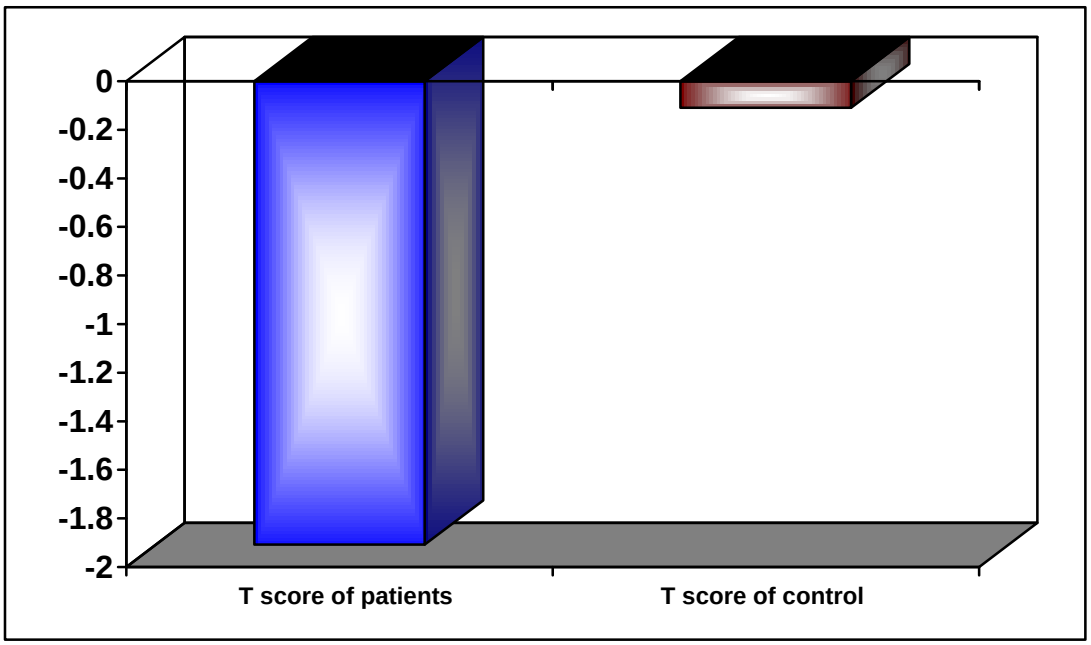

Fig. (5): Comparison between T score of COPD patients and control group.

As shown there is highly significant difference in T score between two groups.

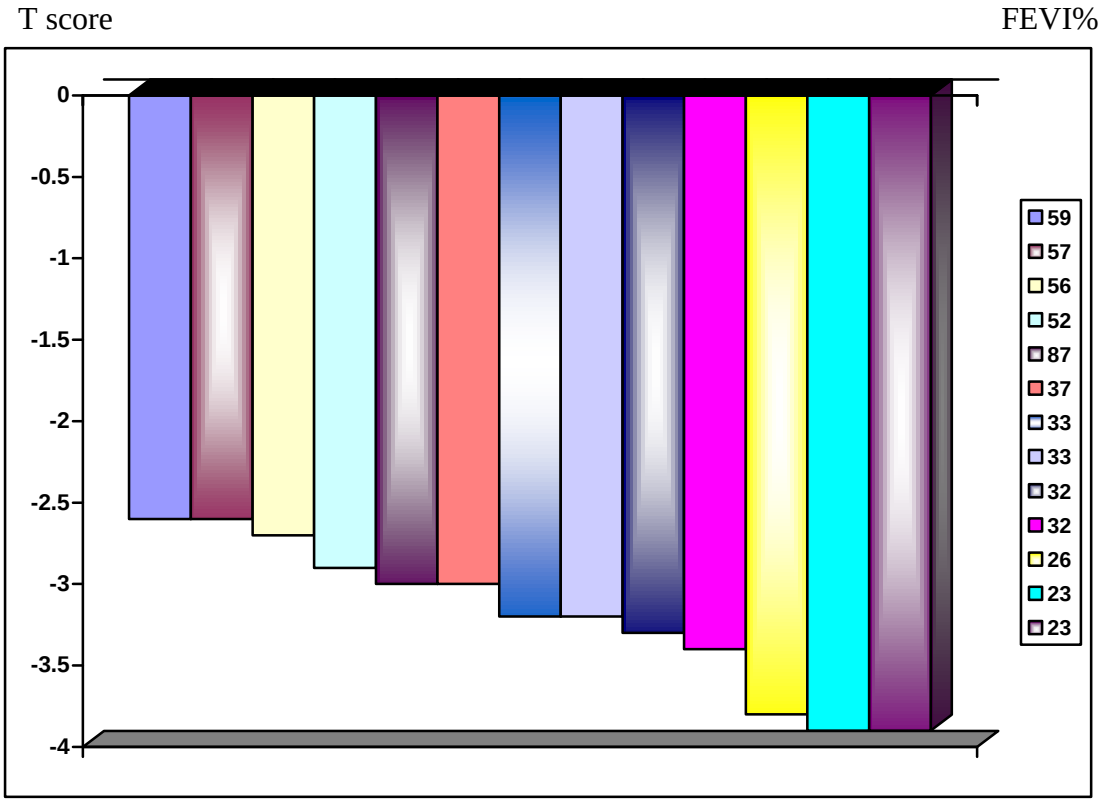

Fig. (6): Correlation between FEV1% and T score in patient with osteoporosis.

Table (9): Linear regression analysis using least square method between forced expiratory volume in the first second (% predicted) and T score:

Regression statistics of FEV1	
Multiple R	0.98
R square	0.66
Adjusted R square	0.97
Standard error of the estimate	47.33
Number of cases	13 cases

There was direct relation between FEV1% and T score.

Table (10): Spearman's rho rank correlations between T score and pulmonary function tests in COPD group:

Parameters	Correlation coefficient	p. value	Sig.
Slow vital capacity%	-0.07	>0.05	NS
Forced vital capacity%	-0.562	<0.05	S
Forced expiratory volume at first second%	-0.986	<0.001	HS
FEV1/FVC ratio	-0.08	>0.05	NS
Forced expiratory flow(25-75)	-0.756	<0.001	HS
peak expiratory flow rate%	-0.852	<0.001	HS

From this table there was;

- Statistically highly significant correlation between T score and FEV1%, FEF(25-75)%, and PEFR%.
- Statistically significant correlation between T score and FVC%.
- Statistically non significant correlation between T score and SVC% and FEV1/FVC ratio.