



RELATION BETWEEN COPD, SMOKING AND DEPRESSION AMONG ELDERLY POPULATION

General Medicine

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ABSTRACT

The remarkable success of medicine and public health over the past century has made it possible for elderly people to live longer than ever before. At present, people over 65 years account for 13% of World population, which will swell to about 20% by 2030, as the 'baby boomers' age. Thus most physicians will spend a significant portion of their professional life dealing with health care of older adults. As per WHO and National Policy for Older Persons, the age used to define Geriatric persons in India is 60 years. Life expectancy in India is 62.8 years in males and 64 years in females. In India, the expectation of life at birth has increased from about 33 years in 1941-51 to over 60 years in 1991-2001. During past 20 years the life expectancy has increased roughly half a year per annum. The prevalence of depression was evaluated in COPD patients and healthy smokers. This study shows Elderly COPD patients who also smoke have a very high prevalence of depression compared to healthy elderly non-smokers. Elderly smokers with COPD have higher prevalence of depression compared to elderly healthy smokers. Elderly healthy smokers have higher prevalence of depression than healthy elderly non-smokers. Prevalence of depression increases with increasing stage of COPD but not to a significant extent.

KEYWORDS

INTRODUCTION

The remarkable success of medicine and public health over the past century has made it possible for elderly people to live longer than ever before. At present, people over 65 years account for 13% of World population, which will swell to about 20% by 2030, as the 'baby boomers' age. Thus most physicians will spend a significant portion of their professional life dealing with health care of older adults.¹

As per WHO and National Policy for Older Persons, the age used to define Geriatric persons in India is 60 years. Life expectancy in India is 62.8 years in males and 64 years in females.² In India, the expectation of life at birth has increased from about 33 years in 1941-51 to over 60 years in 1991-2001. The elderly population in India is the second largest in the world, next only to China. This population which was 77 million according to 2001 census (7.5% of total population) is projected to increase to 137 million in 2021. This population is more likely to present with chronic diseases and atypical manifestations of diseases. COPD is one of the chronic diseases found in this population. COPD is currently the fourth leading cause of death³. COPD is a major cause of disability and death in most countries and contribute significantly to escalating health care costs. In a recent estimate of Disability Adjusted Life Years (DALYs) lost due to a chronic disease, COPD ranked ninth in the world. It is predicted that in 2020, COPD will be the third leading cause of death in the world and fifth leading cause of lost DALYs worldwide. COPD is caused by smoking in 80-90% of cases. The only known measure found to decrease the incidence of COPD and decrease its severity is smoking cessation⁴.

It has been found that smoking is related to depression. Studies show that genes for smoking and depression are closely related and hence cause doubling of depression amongst smokers. Depression affects 10-12% of elderly attending primary care as per Current Geriatrics Diagnosis and Treatment, 2004 edition. The incidence of depression is much higher in Indian population compared to western data.

The occurrence of depression in COPD patients increases the morbidity and mortality in the latter. Indeed studies have shown that depression plays a larger role in determining a patient's quality of life than the severity of COPD. More alarming is the fact that <30% of health care providers recognize depression. Smoking is associated with both depression⁵ and COPD. Smoking, more than adds to the amount of depression in COPD patients.

So, this study was undertaken, to find out whether smoking per se is related to depression and if so whether it adds to depression in people with COPD. Since patients with COPD are nearly always smokers this study also tends to find out whether they are much more depressed than non-smoking controls. This is to stress that all COPD patients require screening for depression and if present should be appropriately treated. Hence aim of this study is to compare the prevalence of depression between the elderly smoking COPD patients, healthy elderly smokers

and healthy elderly controls.

MATERIALS AND METHODS

This study was conducted in the Out Patient Clinic of the Department of Geriatric Medicine for period of six months as a cross Sectional study. Ethics committee approval was obtained. Total number of subjects studied was 90. They were divided into three groups of 30 subjects each. Group A was COPD Patients who are also smokers, Group B was healthy smokers and group C was normal healthy people, nonsmoker.

Participants who were of males with age ≥ 60 years, Smoking bidis > 6 months, 15-30 bidis/day, Current smokers, takes no other tobacco product (both smokeless and smoking varieties), $FEV_1 / FVC < 70\%$. (Post-bronchodilator) No other chronic disorder, living with Family in harmony were included in study. While those with age < 60 years, Non-smokers, Any other chronic illness, any acute illness, post bronchodilator $FEV_1 / FVC > 70\%$ and CXR showing finding suggestive of tuberculosis (or) history of pulmonary tuberculosis were excluded. In group B patients with $FEV_1 / FVC > 70\%$. (Post-bronchodilator) otherwise healthy individuals were included.

All subjects from three groups were administered Geriatric depression scale – 15 version which has been validated in the Indian elderly. A score of more than or equal to 5 was taken as positive for depression and a score of less than 5 was taken as negative for depression. Results were obtained and analyzed statistically. One way ANOVA F test followed by Bonferroni t-test was used to compare; SPSS Version 21 was used.

RESULTS

In our study a total of 90 subjects were studied in three groups, and the mean age in all three groups were similar and there was no statistically significant difference between group with mean age of patients being 69.90, mean age of healthy smokers being 69.80 and healthy controls being 68.43 years. This was similar with height too.

We next evaluated the mean FEV_1 / FVC in all three groups which was significantly lower in group A in patients then two other groups, while there was not much difference between health smokers and controls.

Table 3: Ratio Of FEV_1 / fvc

GROUP	FEV1/FVC		p value
	MEAN	SD	
PATIENTS	54.33	7.07	< 0.001
HEALTHY SMOKERS	75.80	2.47	
CONTROLS	78.06	3.20	

Next, we analyzed the mean GDS (Geriatric depression scale) scores in our study and it was much higher in patients in comparison with other two groups and this was statistically significant too. The difference between each group individually was also significant.

TABLE 4: GDS SCORES IN GROUPS

GROUP	GDS SCORES		p value
	MEAN	SD	
PATIENTS	8.27	4.57	< 0.001
HEALTHY SMOKERS	5.17	3.96	
CONTROLS	2.57	2.70	

We next analysed the result of geriatric depression scale considering it as positive and negative based on score and it was clearly shown that patient's group has higher positivity rate if depression, which was also statistically significant ($p < 0.001$)

Table 3: GDS Result In Groups

GDS RESULT	POSITIVE	NEGATIVE	PERCENTAGE OF POSITIVES
PATIENTS	19	11	63.3
SMOKERS	9	21	30
CONTROLS	2	28	6.7

Similarly, when we analysed the subgroups based on severity of COPD the GDS score and positive rate increased significantly as stage increases, hence incidence of depression increases along with age when combined with COPD severity.

DISCUSSION

This study was done to find out the association between COPD, depression and smoking in elderly people. Here 90 subjects were divided into three groups of 30 each. Age affects depression and so, comparison between groups of different Ages will bias the study. To eliminate bias, age was compared in all three groups using one way ANOVA followed by Modified LSD (Bonferroni) test. p value of 0.6671 was obtained. This is not significant. So, 'Age' as a confounding factor was ruled out.

Using one way ANOVA, followed by Modified LSD (Bonferroni) test, Height was compared in all three groups. p value of 0.626 was obtained. This is not significant. So, 'Height' as a confounding factor was ruled out.

FEV1/FVC was used to separate Group 1 from other two groups. FEV1/FVC < 70% indicates COPD and this is internationally accepted definition (15). So, it was just enough to prove that FEV1/FVC does not vary between Groups 2 and 3. By use of Modified LSD (Bonferroni) test it was found that the means of Groups 2 (75.80) and Group 3 (78.06) do not differ significantly. Thus the role of FEV1/FVC as a confounding factor in non-COPD groups was ruled out.

GDS scores were given to an individual person based on fifteen questions. A person can have any score between zero to fifteen. GDS scores were compared between all three groups using one way ANOVA, followed by Modified LSD (Bonferroni) test. Significant difference was found between all three groups ($p < 0.001$) and each group differed from each other significantly.

GDS scores were compared between all four sub-groups of Group-1 using one way ANOVA, followed by Modified LSD (Bonferroni) test. Significant difference was not found between all four sub-groups ($p = 0.123$). However two homogenous sub sects occurred (sub-groups 1,2,3 and sub-groups 2,3,4). This shows that sub-group1 varied from sub-group 4 but other sub- groups did not differ from each other significantly.

Though GDS scores were compared, comparison of results (positive or negative) is much more important. Geriatric Depression Scale was specifically developed to find out depression in elderly, as depression in elderly manifests differently from that of younger age group. Elderly has more somatic complaints due to depression compared to young patients.

In this study prevalence of depression, Among smoking COPD patients was 63.3%. Among healthy smokers was 30% and Among healthy controls was 6.7%. In the current study, it has been found that the prevalence of depression. Between elderly COPD patients who

smoke and healthy elderly non-smokers was highly statistically significant ($p < 0.001$).

Thus this study observed a significant increase in the prevalence of depression amongst healthy smokers compared to healthy controls. This finding correlates with a survey reported in Psych central of 3,000 individuals in the St. Louis area which confirmed that lifetime frequency of major depression was more common among smokers than nonsmokers (6.6 vs. 2.9 percent).

This also correlates with the findings of a study reported by **Harvard Medical School** on 1000 people which showed depressed people were not more likely than controls to start smoking but once started, a history of daily smoking doubled the risk of developing major depression later on⁶.

Between the elderly COPD patients who smoke and healthy elderly smokers ($p = 0.0191$) was statistically significant. Between healthy elderly smokers and healthy elderly nonsmokers ($p = 0.0419$) was also statistically significant. This is a very valid observation considering the fact that most COPD patients in the community are not screened for depression and also due to the fact that depression more than adds to the morbidity caused by COPD.

As already mentioned, this study also observed a significant increase in the prevalence of depression among COPD patients who smoke compared to healthy smokers.

This correlates with the study by **Edwin.J.Wagena**⁷ which showed that, Smoking people with chronic bronchitis or emphysema were more likely to report suffering from depressed mood when compared with smokers with no long lasting disease (Prevalence rate PR: 29.3 and 9.0% respectively. Odds Ratio, OR for depressed mood = 4.04; 95% CI = 2.56 - 0.39).

The results thus show that COPD per se can cause depression and when smoking adds to it, the prevalence is much higher than in healthy nonsmokers. Since most COPD patients are smokers, the above observation goes on to stress that – Screening for Depression is a *sin qua non* in all COPD patients. This is in correlation with studies of **L.Van Ede et al**⁸ who found an increase in depression among COPD patients compared to controls in three of his studies. Two other studies by of L.Van Ede et al which did not show a significant difference in prevalence of depression between COPD patients and controls were excluded by the Author himself as he found that those studies had defective methodology. He then showed an increased prevalence of depression COPD patients in general population in three of six non controlled studies.

In this study prevalence of depression among subgroups of smoking COPD patients were 0% in stage 1 COPD, 61.5% in stage 2 COPD, 66.7% in stage 3 COPD and 100% in stage 4 COPD. GDS results were compared applying Chi-Square test and was found to be insignificant ($p = 0.15377$) amongst all four sub-groups. Even though the comparison between the stages of COPD and GDS results were not statistically significant, it has been found that the severe COPD patients had more prevalence of depression compared to milder groups.

This contrasts with a study by **Van Manen et al in journal Thorax**⁹. In their study they found 25% depression in severe COPD compared to 19.6% in mild COPD and 17.6% in controls. This difference between the two studies might have been due to the smaller sample size used in this study. However this study correlates with the study of Van Manen et al in that prevalence of depression increases with increasing severity in both studies.

CONCLUSION

The prevalence of depression was evaluated in COPD patients and healthy smokers. This study shows elderly COPD patients who also smoke have a very high prevalence of depression compared to healthy elderly nonsmokers. Elderly smokers with COPD have higher prevalence of depression compared to elderly healthy smokers. Elderly healthy smokers have higher prevalence of depression than healthy elderly nonsmokers. Prevalence of depression increases with increasing stage of COPD but not to a significant extent.

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