

Prevalence of anxiety, depression, and their risk factors among lung cancer patients: A cross-sectional study in a tertiary care center, Kolkata

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ABSTRACT

Background: Depression and anxiety disorders are common among lung cancer patients posing serious problem of treatment interruption, thereby poor prognosis and deterioration of quality of life. **Objectives:** The aim of the study was to find the prevalence of depression and anxiety among lung cancer patients and their respective determinants. **Materials and Methods:** An institution-based cross-sectional prospective study was conducted at the Department of Pulmonary Medicine of a tertiary care hospital at Kolkata over a period of 6 months. Patients were included by complete enumeration method, and an exit interview was conducted with the help of two standardized questionnaires: WHO Disability Assessment Schedule 2.0 to assess disability and Mini International Neuropsychiatric Interview English Version 5.0.0 DSM-IV to detect current major depressive episode (MDE) and generalized anxiety disorder (GAD). Collected data were entered and analyzed in SPSS 20.0 software. **Results:** A total of 210 patients were recruited. Nearly three-fourths of the study population (73.7%) were suffering from current GAD; a significant portion (42.1%) was suffering from current MDE. Both the disorders were diagnosed in 42.1% cases. Multivariate analyses revealed that patients who were currently unemployed or retired, time since diagnosis more than 1 month and suffering from higher degree of disability had higher risk of depression; while patients who were residing at urban area, currently not earning, financially dependent to others and suffering from higher degree of disability had greater risk of developing anxiety during the course of the disease. **Conclusion:** Both depression and anxiety were quite prevalent among lung cancer patients. Social and psychological supports are to be raised to achieve treatment success and a better quality of life by mitigating this problem.


KEY WORDS: Anxiety; Depression; Lung Cancer; Mini-international Neuropsychiatric Interview; WHO Disability Assessment Schedule

INTRODUCTION

Lung cancer is the most common cancer worldwide considering its incidence and mortality.^[1] Due to unavailability of an effective screening tool, most of the cases are usually diagnosed late and result in poor prognosis despite of

providing full range of therapeutic support.^[2] Depression is the most common psychiatric illness found in lung cancer patients with the prevalence of depression ranging from 11% to as high as 44%.^[3,4] Higher rates of clinically significant depression were found in people diagnosed with bronchogenic carcinoma and remained even after the treatment was completed.^[5] Evidences suggest that degree of depression among patients with lung carcinoma is much higher than that of patients suffering from other malignancies.^[5,6] Depression leads to interruption of treatment, poor quality of life, and even increased risk of mortality.^[7-10]

Several studies explored the risk factors associated with depression and anxiety among lung cancer patients. Different

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factors such as physical signs and symptoms including coughing, wheezing, weight loss, insomnia, fatigue and chest pain, educational qualification of the sufferer, functional impairment, low socioeconomic status, anxiety disorder, style of coping, or adjustment with situation were found to be associated with increased risk of depression.^[5,11-14] Other than depression, transient mood disturbances, and anxiety disorders were also frequently found among patients suffering from carcinoma, which often go unreported and unrecognized posing problem to therapeutic intervention of concerned malignancy ultimately leading to poor prognosis of the disease.^[15,16]

Although there are several literatures on depression and anxiety and their risk factors among lung cancer patients, studies are scarce in developing countries specifically in eastern India. With this backdrop, the current study had been taken up to find the prevalence of depression, anxiety, and their predictors among the lung cancer patients attending a tertiary care center at Kolkata.

MATERIALS AND METHODS

An observational study with cross-sectional design had been conducted since January 2017–June 2017 in Medical College, Kolkata, among all the patients diagnosed with lung cancer attending the outpatient department or admitted in the Inpatient Department of Pulmonary Medicine. The institution was purposively selected for the study. Ethical clearance was obtained from the Institutional Ethics Committee, and informed consent had been obtained from each of the participants before data collection. The study subjects were included by complete enumeration method after applying inclusion and exclusion criteria. Patients who were in moribund condition, not able to respond properly to the questionnaire, not giving consent to participate, and having a history of any kind of mental illness before diagnosis of lung carcinoma were excluded from the study.

The study tool was a questionnaire consisting of three parts. The first part contained questions regarding different sociodemographic, economic profile, details of the present disease (stage of the disease, cell type of carcinoma, time elapsed since diagnosis, etc.). The second part was a standardized questionnaire to assess disability – “WHO Disability Assessment Schedule 2.0” (WHODAS 2.0).^[17] It contained 36 items and 6 domains. Domain score for each of the domain and an overall disability score were calculated with maximum and minimum attainable scores of 100 and 0, respectively, where higher scores representing higher level or degree of disability. The third part consisted of Mini International Neuropsychiatric Interview (MINI) English Version 5.0.0 DSM-IV which was used to assess 16 common mental illnesses.^[18,19] In the current study, only major depressive episode (MDE) (current, i.e., in the past 2 weeks)

and generalized anxiety disorder (current, i.e., in the past 6 months) had been assessed through this questionnaire.

The whole questionnaire was first prepared in English. Then, it was translated into Bengali by a linguistic expert keeping semantic equivalence. To check the translation, it was retranslated back into English by two independent researchers who were unaware of the first English version. Pretesting followed by pilot testing was done. Necessary corrections and modifications were made accordingly. Exit interview was conducted for every participant with this schedule.

Statistics

Data thus collected had been entered and analyzed in SPSS 20.0 software. Categorical data were compared by Chi-square with Yates correlation where applicable. Odds ratios (univariate regression) were calculated to predict the strength of association between the dependent and the independent variables. Multivariate logistic regression had been done to find the strength of association between the dependent variable and the independent variable after adjusting for all the independent variables. All the independent variables which were significantly associated with dependent variable in univariate regression or having biological plausibility to be associated with dependent variable were entered in the multivariate logistic model (Link Function=Logistic) using enter method. Hosmer–Lemeshow test was done to check model fitness ($P > 0.05$ =good fit). Nagelkerke R^2 (a pseudo R^2) value had been mentioned in each model to demonstrate the proportion of variability of the dependent variable explained by the predictor variables. All analyses were two-tailed with $P \leq 0.05$ considered statistically significant.

RESULTS

A total of 210 lung cancer patients were included for the final analysis. Majority (48.6%) of the study population belonged to the age group of 60–69 years with the minimum age of 23 years and maximum of 90 years. Mean age of the study population was 60.27 years (standard deviation [SD] = 10.954). Most of them were currently married (84.3%), male (74.3%), educated up to middle level (24.3%), residing at rural area (60%), and belonged to joint family (65.7%). Majority were retired from their job (37.1%), currently not earning anything (72.9%), financially dependent on others (80%), and with son (78.57%) being the main financial supporter and belonged to upper-middle socioeconomic class as per modified BG Prasad scale 2016.^[20] Most of these patients had non-small cell lung carcinoma (82.9%) of which 50% belonged to Stage IV. Only 17.1% of study population were suffering from small cell type, with 75% of them were in extensive stage. Nearly three-fourths (71.4%) of the study population were new cases with no delay between diagnosis

and start of treatment with a mean delay of 1.04 months (SD = 2.863) and a maximum delay of 20 months (1.4%) [Table 1].

Regarding the assessment of disability, median for overall disability score was 65 (interquartile range: 37.33–80.97). Half of the study population suffered from higher level or degree of disability (overall score >median, i.e., 65). Regarding the prevalence of depression and anxiety among the study population, 42.1% and 73.7%, were suffering from current MDEs and current generalized anxiety disorder, respectively, while 42.1% were suffering from both (depression and anxiety) [Figure 1].

Bivariate analyses revealed that there was higher risk of depression among those who were retired or not currently employed, not earning at present, financially dependent to others, suffering from small cell type and advanced stage of lung cancer, and time elapsed since diagnosis was more than 1 month and having higher degree of disability. Subsequently, multivariate analyses concluded that patients, who were retired or not currently employed, not earning at present, time since diagnosis more than 1 month, and suffering from higher degree of disability, were having higher odds of suffering from depression [Table 2].

Regarding factors associated with anxiety, bivariate analyses revealed that patients who were Muslim, residing at urban area, currently retired or unemployed, not earning at present, financially dependent to others, suffering from small cell type lung cancer and advanced stage of the disease, having higher degree of disability, and time since diagnosis more than 1 month had higher risk of developing anxiety during the course of the disease. However, multivariate analyses demonstrated that patients who were residing at urban area, currently not earning, financially dependent to others, and suffering from higher degree of disability were found to have higher odds of developing anxiety during disease trajectory [Table 3].

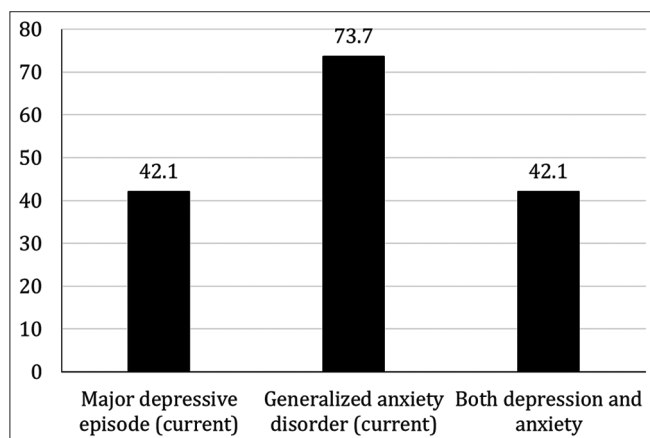


Figure 1: Bar diagram showing the prevalence of depression and anxiety (n=210)

Table 1: Distribution of study population according to sociodemographic, economic, and disease-related characteristics (n=210)

Variable	Frequency (n) (%)
Age (years)	
<40	6 (2.9)
40–50	27 (12.9)
50–60	39 (18.5)
60–70	102 (48.6)
≥70	36 (17.1)
Sex	
Male	156 (74.3)
Female	54 (25.7)
Religion	
Hindu	153 (72.9)
Muslim	57 (27.1)
Marital status	
Married	177 (84.3)
Unmarried	6 (2.9)
Widow/widower/separated	27 (12.9)
Residence	
Rural	126 (60)
Urban	84 (40)
Type of family	
Nuclear	72 (34.3)
Joint	138 (65.7)
Education	
Illiterate	27 (12.8)
Below primary	6 (2.9)
Primary	48 (22.8)
Middle	51 (24.3)
Secondary	39 (18.6)
Graduate and above	39 (18.6)
Employment	
Employed	63 (30)
Unemployed	69 (32.9)
Retired	78 (37.1)
Socioeconomic class*	
Upper	36 (17.1)
Upper middle	84 (40)
Middle	63 (30)
Lower middle	24 (11.4)
Lower	3 (1.4)
Earning at present (includes pension)	
Yes	57 (27.1)
No	153 (72.9)
Financial dependence	
Yes	168 (80)
No	42 (20)

(Contd...)

Table 1: (Continued)

Variable	Frequency (n) (%)
Cell type of carcinoma	
Small cell	36 (17.1)
Non-small cell	174 (82.9)
Adenocarcinoma	39 (22.4)
Squamous cell	90 (51.7)
Sarcomatoid	3 (1.7)
Unclassified	42 (24.1)
Stage of carcinoma	
Small cell	
Extensive	27 (75)
Limited	9 (25)
Non-small cell	
I	6 (3.4)
II	30 (17.2)
III	54 (31)
IV	84 (48.4)

*As per modified BG Prasad scale (2016)

DISCUSSION

The current study found that both depression and anxiety were quite common among the study population. Nearly three-fourths of the study population (73.7%) were suffering from current generalized anxiety disorders; nearly half of the recruited patients (42.1%) were found to be suffering from current MDEs. Both depression and anxiety disorder were found in 42.1% of the study population. Conclusion drawn from multivariate analyses revealed that patients who were not earning currently, had been diagnosed to have lung cancer for more than 1 month and suffering from higher degree of disability, were having greater risk of suffering from depression. Multivariate analyses also showed that patients who were residing at urban area, financially dependent to others, and suffering from higher degree of disability had higher chance of developing anxiety during disease course.

Margari *et al.*^[16] demonstrated that the estimation of depression in their sample was 21.8%, while anxiety was estimated at 17.9%. Kovacevic *et al.*^[3] reported that depression was identified in 29.3% and anxiety in 22.7% in their study among lung cancer patients while Polański *et al.*^[21] found that anxiety was diagnosed in 37.2% and depression in 41.7% by hospital anxiety and depression scale (HADS). The present study revealed quite a higher prevalence of both anxiety and depression than the above studies. The possibility of this inconsistency might be the use of a different scale to diagnose depression and anxiety (MINI) while above-mentioned researchers used HADS to detect the same. Anxiety disorder was found to be more common than depression according to current study results.

Patients who were suffering from depression also suffered from anxiety. Being a chronic disease with poor prognosis despite of all sorts of therapeutic intervention, lung cancer leads to psychiatric illness during disease trajectory. Tremendously high cost of treatment and late diagnosis due to lack of sensitive screening tool, unawareness, carelessness specifically in lower socioeconomic strata in developing countries like India result in increased rate of disability, loss of wages, and economical dependence to near ones. All of the above factors ultimately resulted in increased prevalence of anxiety and depression among patients. The present study also revealed several factors by bivariate and multivariate analyses as mentioned earlier which were responsible for higher chance of developing depression and anxiety. These factors were not studied thoroughly in previous researches. Margari *et al.*^[16] found statistically significant correlations between depression and hospitalization while Hung *et al.*^[22] reported that in lung cancer patients, age ≤ 50 years, age 50–69 years, female gender, coronary artery disease, and operation were associated with an increased risk of depression although these findings were not consistent with the current study. Some of these factors were not studied in the present research either.

This was a single center study carried out at a tertiary care hospital with limited sample size. Therefore, the result of this study may not be the true representation of the psychological status of all lung cancer patients in the community. The present research had been concentrated only on finding depression and anxiety (current episode) among lung cancer patients. Further researches can enlighten the prevalence of other mental disorders and their impact on specific interventions in lung carcinoma. Researches with improved study designs like cohort study or qualitative researches like in-depth interviews and focused group discussions can provide more appropriate and comprehensive understanding of the factors related to mental health of these patients.

CONCLUSION

The current cross-sectional study among lung cancer patients in a tertiary care center at Kolkata found that both depression and anxiety were extremely common with nearly three-fourths of the study population (73.7%) were suffering from current generalized anxiety disorders; nearly half of the recruited patients (42.1%) were found to be suffering from current MDEs and 42.1% of the study population had both depression and anxiety disorder. Mental health is a multifactorial issue and achievement of good mental health is of immense importance during course of any disease, specifically a chronic disease like lung carcinoma. Although it is a fact that many a times depression, anxiety, and other mental health illness among these patients go undiagnosed and unreported, efforts in the form of vigorous researches, psychological supports, social

Table 2: Factors associated with depression among study population: Bivariate and multivariate analyses (n=210)

Variables	Major depressive episode (current)		Test of significance	OR (95% CI)	AOR (95%CI)
	Present	Absent			
Age (years)			Chi-square=0.058, df=1, P=0.810	1.069 (0.618–1.851)	-
>62	42	48			
≤62 (median)	54	66			
Sex			Chi-square=0.047, df=1, P=0.828	1.071 (0.575–1.996)	-
Male	72	84			
Female	24	30			
Religion			Chi-square=1.508, df=1, P=0.219	0.683 (0.371–1.257)	-
Hindu	66	87			
Muslim	30	27			
Marital status					
Unmarried/separated/widow/widower	15	18	Chi-square=0.001, df=1, P=0.974	0.988 (0.468–2.083)	-
Married	81	96			
Education			Chi-square=0.580, df=1, P=0.446	1.245 (0.708–2.189)	-
Up to middle level	63	69			
Secondary and above	33	45			
Residence			Chi-square=0.461, df=1, P=0.497	1.212 (0.695–2.113)	-
Rural	60	66			
Urban	36	48			
Type of family			Chi-square=0.001, df=1, P=0.980	1.007 (0.569–1.785)	-
Nuclear	33	39			
Joint	63	75			
Per capita income			Chi-square=2.072, df=1, P=0.150	1.50 (0.863–2.608)	-
≤4000 (median)	60	60			
>4000	36	54			
Employment			Chi-square=9.668, df=1, P=0.002	2.597 (1.411–4.781)	2.391 (1.421–6.961)
Unemployed/retired	75	66			
Employed	21	48			
Earning at present (includes pension)			Chi-square=39.035, df=1, P=0.000	12.143 (4.912–30.020)	12.798 (2.598–63.036)
No	90	63			
Yes	6	51			
Financial dependence			Chi-square=31.474, df=1, P=0.000	16.120 (4.792–54.224)	1.683 (0.093–5.038)
Yes	93	75			
No	3	39			
Cell type of carcinoma			Chi-square=3.454, df=1, P=0.043	2 (1.995–4.190)	1.023 (0.846–6.049)
Small cell	21	14			
Non-small cell	75	100			
Stage of carcinoma			Chi-square=15.260, df=1, P=0.000	4.462 (2.021–9.848)	1.873 (0.723–2.729)
Advanced*	87	78			
Early	9	36			
Time elapsed since diagnosis			Chi-square=19.964, df=1, P=0.000	4.148 (2.176–7.906)	3.166 (1.030–9.726)
≥1 month	42	18			
<1 month (median)	54	96			
Disability			Chi-square=99.474, df=1, P=0.000	31 (14.380–66.830)	24.039 (12.833–90.178)
High (>median)	84	21			
Low (≤median)	12	93			

Hosmer–Lemeshow test: P=0.189. Nagelkerke R²=0.669. *Stages III-IV of non-small cell type and extensive small-cell lung carcinoma were considered as advanced stage of carcinoma, CI: Confident interval, AOR: Adjusted odds ratios, OR: Odds ratios

Table 3: Factors associated with anxiety among study population: Bivariate and multivariate analyses ($n=210$)

Variables	Generalized anxiety disorder (current)		Test of significance	OR (95% CI)	AOR (95%CI)
	Present	Absent			
Age (years)			Chi-square=1.094, df=1, $P=0.296$	0.697 (0.354–1.374)	-
>62	69	21			
≤62 (median)	99	21			
Sex			Chi-square=0.224, df=1, $P=0.636$	1.2 (0.564–2.553)	-
Male	126	30			
Female	42	12			
Religion			Chi-square=4.389, df=1, $P=0.036$	2.615 (1.037–6.594)	1.051 (0.316–3.493)
Muslim	51	6			
Hindu	117	36			
Marital status			Chi-square=0.081, df=1, $P=0.776$	1.149 (0.441–2.993)	-
Unmarried/separated/widow/widower	27	6			
Married	141	36			
Education			Chi-square=0.046, df=1, $P=0.830$	0.926 (0.458–1.872)	-
Up to middle level	105	27			
Secondary and above	63	15			
Residence			Chi-square=14.464, df=1, $P=0.000$	5.2 (2.081–12.995)	4.012 (1.253–33.810)
Urban	78	6			
Rural	90	36			
Type of family			Chi-square=0.048, df=1, $P=0.827$	0.924 (0.456–1.875)	-
Nuclear	57	15			
Joint	111	27			
Per capita income			Chi-square=0.000, df=1, $P=0.100$	1 (0.505–1.980)	-
≤4000 (median)	96	24			
>4000	72	18			
Employment			Chi-square=6.994, df=1, $P=0.008$	2.5 (1.252–4.991)	1.814 (0.779–8.452)
Unemployed/retired	120	21			
Employed	48	21			
Earning at present (includes pension)			Chi-square=23.893, df=1, $P=0.000$	5.455 (2.655–11.206)	2.334 (1.260–43.998)
No	135	18			
Yes	33	24			
Financial dependence			Chi-square=29.531, df=1, $P=0.000$	7 (3.279–14.941)	5.631 (3.423–23.412)
Yes	147	21			
No	21	21			
Cell type of carcinoma			Chi-square=10.500, df=1, $P=0.001$	3.059 (1.211–1.430)	1.421 (0.768–32.423)
Small cell	32	3			
Non-small cell	136	39			
Stage of carcinoma			Chi-square=6.364, df=1, $P=0.012$	2.556 (1.214–5.380)	0.998 (0.685–12.142)
Advanced*	138	27			
Early	30	15			
Time elapsed since diagnosis			Chi-square=5.250, df=1, $P=0.022$	2.842 (1.129–7.153)	0.796 (0.443–9.831)
≥1 month	54	6			
<1 month (median)	114	36			
Disability			Chi-square=38.571, df=1, $P=0.000$	20.091 (5.965–67.674)	19.129 (4.556–74.547)
High	102	3			
Low	66	39			

Hosmer–Lemeshow test: $P=0.881$. Nagelkerke $R^2=0.586$. *Stage III-IV of non-small cell type and extensive small-cell lung carcinoma were considered as advanced stage of carcinoma, CI: Confident interval, AOR: Adjusted odds ratios, OR: Odds ratios

supports, and social security schemes should be enforced to address the hidden factors related to mental illnesses among these patients so that the therapeutic interventions related to cancer can go uninterrupted. Evidence showed that mental illness can increase the chances of poor prognosis among cancer patients. Therefore, to improve prognosis and to provide a better quality of life, these issues should be addressed simultaneously without any negligence.

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