IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 4 Ser. 3 (April. 2019), PP 37-42
www.iosrjournals.org

Quality Of Life Among Lung Cancer Patients And Socio-Economic Status- Do They Correlate At All? A Cross-Sectional Study In A Tertiary Care Centre At Kolkata

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Abstract:
Background*: Quality of life is a subjective multidimensional issue. It is also considered as an important prognostic factor among lung cancer patients. Measuring and understanding of the factors that might have significant impact in deciding the quality of life of lung cancer patients are therefore of utmost importance as lung cancer is one of the topmost cancers worldwide at present, considering its incidence, prevalence and mortality.*
Methods*: An institution based cross-sectional study had been conducted in a tertiary care centre, Kolkata among 210 lung cancer patients with a pretested questionnaire which contained two standardized questionnaires to measure quality of life (EORTC QLQ-C30 and EORTC QLQ-LC13).*
Results: *Half of the study population experienced poor quality of life. Regarding the factors affecting quality of life, patients who were suffering from small cell carcinoma and advanced stage of the disease, had poor quality of life. Socio-demographic and economic factors did not play any role in shaping quality of life of these patients.*
Keywords: *Kolkata, Lung cancer, Quality of life, Socio-economic status*

Date of Submission: 20-03-2019 Date of acceptance: 06-04-2019

I. Introduction

Lung cancer is one of the most common malignancy worldwide other than breast cancer, contributing to 12.3% of the total number of new malignancies diagnosed in 2018. It is also the commonest cancer in men and one of the top three cancers in women globally, constituting about 15.5% and 8.8% of the total number of newly detected cases in 2018, respectively (1). Broadly there are two types of primary carcinoma of the lungs: non-small-cell lung cancer (NSCLC) and small-cell lung cancer (SCLC). Worldwide more than 80% of all lung cancers are of non-small cell type which constitutes a significant proportion of mortality in patients of this kind. Small cell carcinoma, constituting only 20%, also has a poor prognosis with an average survival of 12-16 months for limited stage and of only 7-11 months for extensive stage (2). Quality of life is considered as an important prognostic factor, that is to be established by the physicians before beginning of the therapy in lung cancer patients. It is one of the major predictors of survival (3).

There are evidences that socio-economic background plays a vital role to increase the risk of lung carcinoma with its prevalence being higher among backward classes (4,5,6). Several literatures are also there to establish the relationship between quality of life in cancer patients and different socio-demographic and economic factors in various parts of the world. Some of them showed evidence of association between the above two, whereas rest showed none (7,8). In context to lung cancer, influence of income to quality of life had been established by previous researches as well (9,10). Although there are many socio-demographic factors other than income which can influence quality of life of lung cancer patients, studies are scarce in this regard, especially in Eastern India. With this backdrop, the present study had been taken up to assess the quality of life of lung cancer patients and to find out the socio-demographic and economic factors which might have influence on the same.

II. Material and Methods

An institution based cross-sectional study had been conducted from January 2017 to June 2017 in Medical College, Kolkata which was purposively selected for the study. All the patients diagnosed with lung cancer attending the outpatient department or admitted in the inpatient department of Pulmonary Medicine during the study period were included by complete enumeration method. Institutional ethical clearance was obtained and informed consent was taken from each participant. Patients who were in moribund condition, not able to respond properly to the questionnaire, not giving consent to participate were excluded from the study. Thus, a total of 210 lung cancer patients were included for final analysis.

The study tool consisted of a questionnaire which had two parts. The first part contained information regarding different socio-demographic, economic profile, details of the present disease (stage of the disease, cell type of carcinoma, time lapsed since diagnosis, initial treatment mode etc.). The second part consisted of two standardized questionnaires for assessment of quality of life in lung cancer patients. One was the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) (11), and the other one was EORTC Lung Cancer Questionnaire (EORTC QLQ-LC13) with maximum and minimum attainable score being 100 and 0 respectively for each of the domains (12).

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. Data thus collected had been entered and analyzed in SPSS 20.0 software (IBM Corp., Armonk, N.Y., USA).

III. Result

Majority (48.6%) of the study population belonged to the age group of 60-69 years with the minimum age of 23 years, maximum of 90 years and mean of 60.27 years (SD=10.954). Most of them were male (74.3%), currently married (84.3%), residing at rural area (60%), educated up to middle level (24.3%) and belonged to joint family (65.7%). Regarding employment and income, majority were retired (37.1%), currently not earning at all (72.9%), dependent financially on others (80%) with son (78.57%) being the main financial supporter and belonged to upper-middle socio-economic class as per modified B.G Prasad scale 2016 (13). Majority of the patients were suffering from non-small cell 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. The commonest method of diagnosis for these patients was CT/USG guided trucut biopsy (55.7%), the others being endobronchial biopsy (27.1%), pleural fluid cell block (14.3%) and fibreoptic bronchoscopy along with lymph node excision biopsy (2.9%). The commonest mode of initial therapy after diagnosis was best supportive care (50%), followed by chemotherapy (40.9%) and chemo-radiotherapy (9.1%). Only 12.9% of the study population was found to have undergone significant weight loss. More than half (71.4%) of the study population were new cases with no delay between diagnosis and start of treatment with a mean of 1.04 months (SD=2.863) and a maximum delay of 20 months (1.4%). [Table 1]

Table No. 1: Distribution of study population according to socio-demographic, economic and disease related characteristics (n=210)

Variable	Frequency	Percentage (%)
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	60.0
Urban	84	40.0

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	30.0
Unemployed	69	32.9
Retired	78	37.1
Socio-economic class*		
Upper	36	17.1
Upper middle	84	40.0
Middle	63	30.0
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	80.0
No	42	20.0
Cell type of carcinoma		
Small cell	36	17.1
Non-small cell	174	82.9
i) Adenocarcinoma	39	22.4
ii) Squamous cell	90	51.7
iii) Sarcomatoid	3	1.7
iv) Unclassified	42	24.1
Stage of carcinoma		
Small cell		
i) Extensive	27	75.0
ii) Limited	9	25.0
Non-small cell		
i) I	6	3.4
ii) II	30	17.2
iii) III	54	31.0
iv) IV	84	48.4
Method of diagnosis		
CT/USG guided trucut biopsy	117	55.7
Endobronchial biopsy	57	27.1
Fibreoptic bronchoscopy+ lymphnode excision biopsy	6	2.9
Pleural fluid cell block	30	14.3
Initial treatment (n=66)**		
Best supportive care	33	50.0
Chemotherapy	6	9.1
Chemo-radiotherapy	27	40.9
Weight loss***		
Significant	27	12.9
Possible	57	27.1
Weight steady	126	60.0

*As per modified BG Prasad scale (2016)

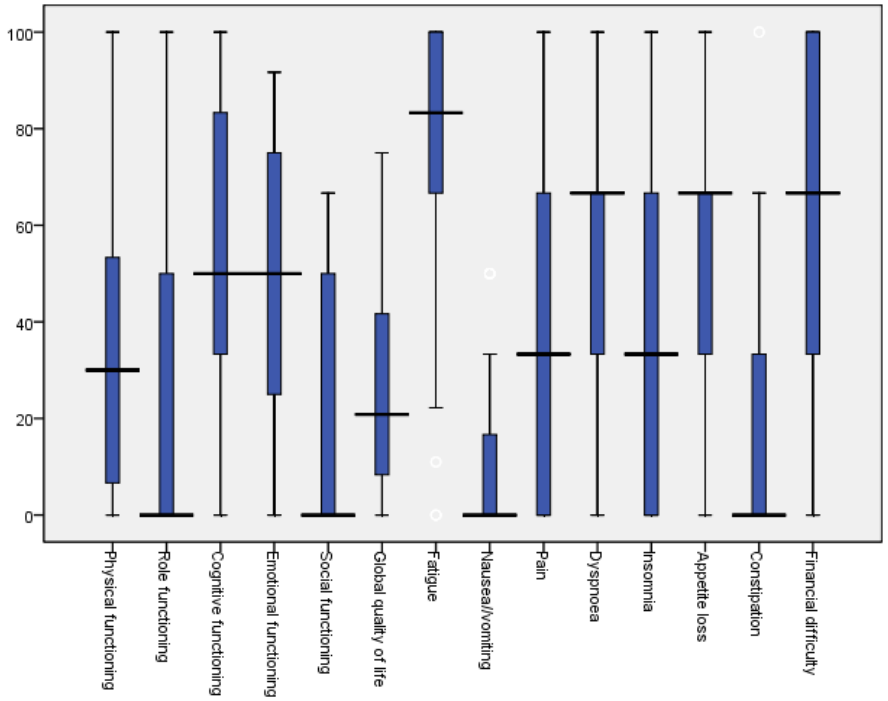
** In 144 newly diagnosed cases, treatment mode was not decided yet just after diagnosis

***Significant weight loss=10% weight loss during 6 months prior to diagnosis, possible weight loss=although it was not clear whether a patient had a significant weight loss or not, the consultant commented in the case record that the patient had possible weight loss.

Regarding quality of life, total 15 domains had been assessed by EORTC QLQ-C30. The median score was 30 (IQR=6.67-53.33) for physical functioning, 0 (IQR=0-50) for role functioning, 50 (IQR= 33.33-83.33) for cognitive functioning, 50 (IQR=25-75) for emotional functioning, 0 (IQR=0-50) for social functioning and 20.84 (IQR=8.33-41.67) for global quality of life where higher scores indicated better quality of life. Regarding symptom related domains, the median scores found to be 83.28 (IQR=66.67-100.0) for fatigue, 0 (IQR= 0-16.67) for nausea/vomiting, 33.33 (IQR=0-66.67) for pain, 66.67(IQR=33.33-66.67) for dyspnea, 33.33

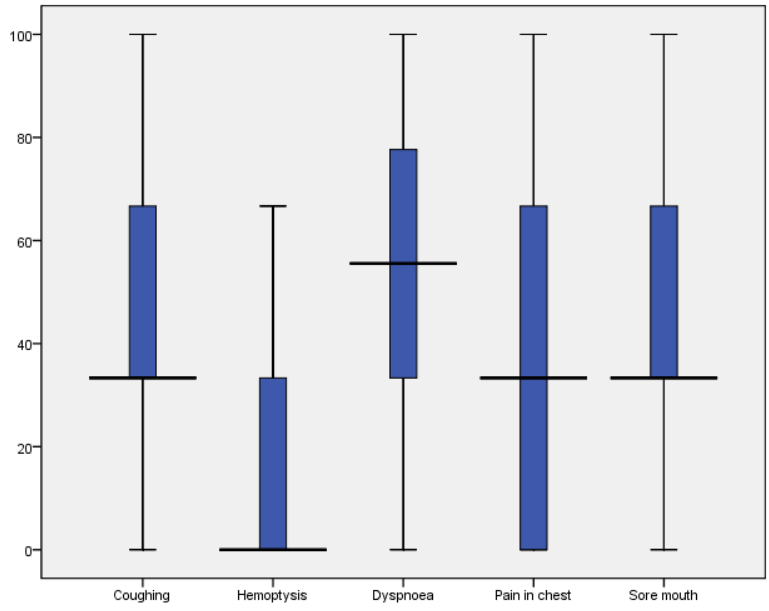
(IQR=0-66.67) for insomnia, 66.67 (IQR=33.33-66.67) for appetite loss, 0 (IQR=0-33.33) for constipation and diarrhea, 66.67 (IQR=33.33-100.0) for financial difficulty where higher scores depicted worse condition. EORTC QLQ-C30 summary score revealed that half of the study population was having poor quality of life (summary score < 48.85 i.e. median score with IQR of 35.89-69.23). [Fig 1]

Figure No. 1: Quality of life of study population as measured by EORTC QLQ-C30 (n=210)



Regarding quality of life as per EORTC QLQ-LC13, median score was 33.33 (IQR=33.33-66.67) for coughing, 0 (0-33.33) for hemoptysis, 55.55 (IQR=33.33-77.67) for dyspnea, 33.33 (IQR=0-66.67) for pain in chest, 0 for pain in arm/other part of body as well as for alopecia, dysphagia and peripheral neuropathy, 33.33 (IQR=33.33-66.67) for sore in mouth where higher scores indicated worse situation. [Fig 2]

Figure no. 2: Quality of life of study population as measured by EORTC QLQ-LC13 (n=210)



Regarding different factors related to quality of life, bi-variate analysis revealed that quality of life was poor in cases of religion being Muslim, persons who were not earning at present, financially dependent to others, suffering from small cell carcinoma and advanced stage of the disease. Subsequently on multivariate analysis, it was found that there was no impact to socio-demographic/economic factors on quality of life, while cell type of carcinoma and stage of the disease being two significant factors related to the same. [Table 2]

Table No. 2: Factors related to quality of life: Bi-variate and Multivariate analyses (n=210)

Variables	Quality of life		Test of significance	OR (95% CI)	AOR (95%CI)
	Poor (≤median)	Good (>median)			
Age (years)			Chi square=0.700,df=1, p=0.403	0.792(0.458-1.369)	-
≤ 62 (median)	42	48			
>62	63	57			
Sex			Chi square=0.000,df=1, p=0.563	1.0 (0.539-1.857)	-
Female	27	27			
Male	78	78			
Religion			Chi square=5.418,df=1, p=0.020	2.087 (1.117-3.9)	1.556 (0.756-3.203)
Muslim	36	21			
Hindu	69	84			
Marital status			Chi square=2.912,df=1, p=0.088	1.938 (0.899-4.177)	-
Unmarried/separated/ Widow/widower	21	12			
Married	84	93			
Education			Chi square=0.734,df=1, p=0.392	0.783 (0.447-1.372)	-
Up to middle level	63	69			
Secondary and above	42	36			
Residence			Chi square=0.000,df=1, p=0.556	1.0 (0.576-1.737)	-
Urban	63	63			
Rural	42	42			
Type of family			Chi square=0.000,df=1, p=0.558	1.0 (0.566-1.768)	-
Nuclear	36	36			
Joint	69	69			
Per capita income			Chi square=2.8,df=1, p=0.094	1.598 (0.922-2.772)	-
≤4000 (median)	66	54			
>4000	39	51			
Employment			Chi square=1.748,df=1, p=0.186	1.477 (0.827-2.637)	-
Unemployed/retired	75	66			
Employed	30	39			
Earning at present (includes pension)			Chi square=26.223,df=1, p=0.000	5.813 (2.844-11.878)	2.503 (0.817-7.666)
No	93	60			
Yes	12	45			
Financial dependence			Chi square=26.786,df=1, p=0.000	8.609 (3.440-21.543)	2.608 (0.656-10.373)
Yes	99	69			
No	6	36			
Cell type of carcinoma			Chi square=19.310,df=1, p=0.000	6.6 (2.613-16.669)	9.313 (2.998-28.931)
Small cell	30	6			
Non-small cell	75	99			
Stage of carcinoma*			Chi square=12.473,df=1, p=0.000	3.552 (1.714-7.362)	3.861 (1.662-8.970)
Advanced	93	72			
Early	12	33			
Hosmer Lemeshow test: p=0.142 Nagelkerke $R^2 = 0.539$					

* Stage I, II of non-small cell type and limited stage of small cell type included in early stage of carcinoma, while stage III, IV of non-small cell type and extensive stage of small cell type included in advanced stage of the disease.

IV. Discussion

Quality of life is a broad, subjective, and multidimensional concept that includes physical health and symptoms, functional status and activities of daily living, mental well-being and social health, including social role functioning. It can also be simply defined as the effect of an illness and its therapy upon a patient′s physical, psychological, and social well-being as perceived by the patient himself (14). The present study was a cross-sectional study to assess quality of life of lung cancer patients and various factors affecting the same with the main focus to establish the relationship of quality of life and socio-demographic-economic factors, if any. The results of this study suggested that there was no role of socio-demographic-economic factors in shaping quality of life of the study population. Multivariate analyses revealed only cell type and stage of the disease had influence on quality of life.

Previous researches on this aspect had varied conclusions. Montazeri A et al (10) showed that quality of life is not only the outcome of the disease and its treatment, but is also highly dependent on each patients' socioeconomic characteristics which was not consistent with the findings of the present study. The study by Montazeri A et al (10) was a prospective study which indicated socio-economic factors have specific influence in quality of life among lung cancer patients during baseline evaluation, though follow up investigation did not represent the same finding; while the current study used advanced analysis (regression) which had also been used by Wan GJ et al (8) and revealed consistent result with this study, but Montazeri A et al (10) had not used this analysis to depict the result.

There is an inbuilt thought that patients from lower socio-economic class would have a poor quality of life not only at the time of diagnosis, also during therapy which had been well established by Penson DF et al (15) in their study among prostate cancer patients showing significant relation between quality of life and income. On the other hand, Litwin MS et al (16) revealed that during therapy, quality of life was poor in patients with higher education. Both of the above findings were not consistent with the results of the current study.

Both advanced stage malignancy and small cell carcinoma are individually poor prognostic factor regarding survival of lung carcinoma patients. During bi-variate analysis, this study depicted that religion, financial dependence, earning currently or not were the factors which had impact on quality of life other than cell type and stage of disease. But during regression analyses, they lost significance with the conclusion that cell type and stage of disease had more impact on ultimate prognosis and thereby on quality of life.

Current study was a cross-sectional study with inherent bias of not revealing all the factors related to outcome. Thus, further improved study designs could be applied to find out the impact of socio-demographic-economic factors on quality of life in lung cancer patients.

V. Conclusion

The present study findings depicted that there is no role of socio-demographic and economic factors in shaping quality of life of lung cancer patients. Stage and cell type of the disease were more important regarding prognosis. Therefore, early diagnosis and prompt treatment could somehow halt the disease progression and thereby improve the quality of life in these patients. Further multi-centric researches with advanced study designs should be done in this regard as socio-economic context varies widely making the understanding of their impact on quality of life difficult.

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Jayita Pal. "Quality Of Life Among Lung Cancer Patients And Socio-Economic Status- Do They Correlate At All? A Cross-Sectional Study In A Tertiary Care Centre At Kolkata." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 04, 2019, pp 37-42.