Financial Burden of Lung Cancer Patients Attending Specialized Hospitals

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Abstract

Lung cancer is a major public health problem for both developed and developing countries. Prognosis of lung cancer is not satisfactory; moreover treatment cost is very high. This cross-sectional study was conducted among 121 lung cancer patients to estimate financial burden of lung cancer attended in various specialized hospitals in Dhaka. Most i.e. 107 (88.4%) of the patients were male. Mean (±SD) age of the patients was 55.51(±10.781) years. Majority i.e. 54(44.6%) of the patients were from 41-59 years age group and majority i.e. 37(30.6%) of the patients had primary level education. Among all lung cancer patients, 37(30.6%) were business men and

most i.e. 111(91.7%) of the patients were Muslim. Majority i.e. 106 (87.6%) of the lung cancer patients came from nuclear family. Average (± SD) monthly family income of lung cancer patients was Tk. 21673.55±12363.035. Majority i.e. 48(39.7%) of the patient was diagnosed at first in chamber of specialist doctor. Majority i.e. 46(38%) of the patient took treatment first in Private hospital. Average (±SD) direct treatment cost was Tk. 25175.21(±SD10664.151). Average (±SD) indirect treatment cost was Tk. 9220.66(±SD7599.958). Average treatment cost was Tk. 34363.64(±SD13761.015). Majority i.e. 114 (94.21%) of lung cancer patients maintained their treatment cost from household savings. This study showed that majority i.e. 91 (75.2%) of the patients had node size and majority i.e. 90(74.4%) of the patients had no metastases. Majority i.e. 65(53.7%) of lung cancer patients had Grade-2 cancer. Majority i.e. 59(48.8%) of the patient was treated by Chemotherapy. Association between direct cost and family income, nature of treatment, place of treatment (hospital) were statistically significant [χ^2, p<0.05]. Association between indirect cost and sex, educational qualification, occupation, family income, age, metastases were statistically significant [χ^2, p<0.05]. Association between treatment cost and family income, place of treatment (hospital) were statistically significant [χ^2, p<0.05]. The study findings in respect of financial burden of lung cancer patient may contribute to take measures for minimizing treatment cost.

Key words: Lung Cancer Patient, Financial Burden

INTRODUCTION:

Cancer is a major challenge for our society today. Cancer affects large number of people worldwide and it has devastating effect on individual, family and society. However there is much reason for optimism. Major achievements has been obtained for prevention and cure and in coming years huge improvement in treatment of all types of cancer is expected, but these welcome improvements will place substantial and diverse pressure on our health care system (WHO,2007).

Lung cancer is the uncontrolled growth of abnormal cells in one or both of the lungs, while normal cells reproduce and develop into healthy lung tissue, these abnormal cells reproduce faster and never grow into normal lung tissue .Lumps of cancer cells (tumors) then form and grow .Besides interfering with how the lung functions, cancer cells can spread from the tumor into the bloodstream or lymphatic system where they can spread to other organs (Environmental Protection Agency, 2002).

Mortality from lung cancer is the second after stomach cancer with a mortality rate of 5.3 per 100000 populations and responsible for close to 33000 years of healthy life lost in Iran (Naghavi et al. 2007). The major risk factors of lung cancer is smoking and the smoking prevalence is moderate, close to 24% among general population. The clinical manifestation of lung cancer is extremely demanding and yearly survival rate is less than 30% in different places (Ries 1994). Lung cancer is usually treated with surgery, chemotherapy, and/or radiation, and may require other services. The treatment of lung cancer can be defined more precisely by histological type and specific location of the cancer in the lung. The financial burden of lung cancer is devastating to family as well as to the society as general it is considered one of the costly diseases among the likes (Meropol et al. 2007). The cost of lung cancer in the United States in the year 2010 has been estimated as 268 billion of this 102.8 billion for direct and 20.9 billion for indirect costs (American Cancer Society, 2010).

According to the latest WHO data published in April 2011 Lung Cancers Deaths in Bangladesh reached 18,124 or 1.89% of total deaths. The age adjusted death rate is 20.29 per 100,000 of population ranks Bangladesh #59 in the world. (WHO, 2011).

According to the Hospital Cancer Registry of National Institute of Cancer Research & Hospital, Dhaka, Bangladesh, the occurrence of lung cancer is 16.7% of all cancers and the most common cancer (25%) among the male cancer patients, 6.1:1 male female ratio. Approximately 95 percent of all lung cancers are classified as either small cell lung cancer (SCLC) or non-small cell lung cancer (NSCLC). This distinction is essential for staging, treatment, and prognosis. Other cell types comprise about 5 percent of malignancies arising in the lung. Surgery is the treatment of choice for NSCLC if the primary

tumor is resectable and if metastatic disease is absent. Chemotherapy and radiation therapy are used to treat tumors that are unresectable because of intrathoracic spread or distant metastases. Small cell lung cancer (SCLC), which metastasies early and has a worse outcome than NSCLC, has a separate staging system (Parkin et al. 2002, Jemal et al. 2008, Talukder et al. 2005).

MATERIALS AND METHODS:

Study design: It was a cross-sectional study among the Lung cancer patients to know about their financial burden.

Study Place: The study was conducted in Dhaka Medical College Hospital (DMCH), Dhaka; National Institute of Cancer and Research Hospital (NICRH), Mohakhali, Dhaka; and Delta Medical College Hospital, Mirpur, Dhaka.

Study period : The study was conducted for a period of 12 months with effect from January'13- December'13.

Study Population: Diagnosed (Age $\geq$ 20 years old) Lung Cancer patients who attended in Dhaka Medical College Hospital (DMCH), Dhaka; National Institute of Cancer and Research Hospital (NICRH), Mohakhali, Dhaka; and Delta Medical College Hospital, Mirpur, Dhaka were the study population.

Sample size: Due to the constraint of time, money and other resources data were collected from121 lung cancer patients.

Data Collection Instrument: A pre-tested semi-structured questionnaire in Bangla and check list was used for data collection. According to specific objectives, the variables were identified and an English questionnaire was drafted and translated into Bangla. The questionnaire was pretested on 10 respondents with similar background who were not included in the study. After necessary modification the questionnaire was finalized. Data were collected by face to face interview. No medical examination or tests were done.

Data processing and analysis: After completion of data collection, those were checked, edited for consistency and rechecked. Then the data were transferred to suitable designed dummy tables for processing and analysis. Data analysis was done by using available version of SPSS software. SPSS computer package was used for data entry, analysis and calculation. The various tables were made and

analyzed according to the objectives, frequency distribution, mean value with standard deviation were calculated and presented in the table where necessary. Significant test were done by chi-square tests.

Ethical issues: Ethical clearance was taken from ethical committee of NIPSOM prior to initiation of study. Permission from the director of the hospital was taken. Informed written consent was taken from the patients before interview. Privacy of the patients was maintained and interview is not being disclosed to any unauthorized person. Complete assurance was given that all information provided by the patient will be kept confidential. Their name or anything which can be identified them is not published. Their participation and contribution was acknowledged with due respect. Full freedom of respondents to refuse and withdraw himself from the study anytime was taken into consideration.

RESULTS

Name of different place from where data were collected:
In this study majority of the data were collected from NICRH i.e. 66(55%) than from Delta hospital 44(36%) and from DMCH 11(9%) which are shown in figure-1.

Fig-1 Place of data collection
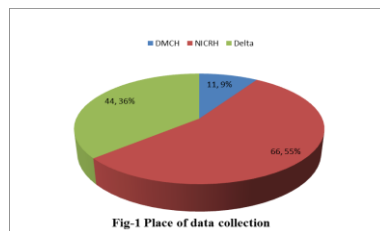
Sociodemoghraphic characteristics:

Table: 1

Sociodemoghraphic characteristics	Percentage
Sex	Male 88.4%
Age	41-59 age group 44.6%
Education	Primary 30.6%
Occupation	Bussiness 30.6%
Religion	Muslim 91.7%

Marital status	Married 92.6%
Types of family	Nuclear 88%
Family member	2-7 81%
Monthly income	10001-20000 44.6%

Lung cancer related information:

Table 2

Lung cancer related information		Percentage
Duration of time of lung cancer	1-7 months	71.9%
Place of Diagnosis	Chamber of specialist doctor	30.7%
Place of treatment	Private hospital	38%

Stage of Lung cancer:

Table 3

Stage of lung cancer	Percentage
Distribution of the patient according to node (N) involvement	N_0 75.2%
Distribution of the patient according to metastases (M)	No metastases 74.4%
Distribution of the patient according to grading of lung cancer	Grade 2 53.7%
Distribution of lung cancer patients by nature of treatment	Chemotherapy 48.8%

Distribution of cost of treatment of the patients

In this study average cost of treatment was Tk. 34363.64 (±SD13761.015). Majority of i.e. 47(38.8%) patient's bore cost for treatment were within Tk. 30001-50000, 41(33.9%) were within Tk. 20001-30000, 18(14.9%) were within Tk. 50001-70000 and 15(12.4%) were within Tk. 10000-20000 which are shown in table -20

Distribution of total cost of treatment of the patients

Table 4

Total cost of treatment (Tk.)	Frequency	Percent
10000-20000	15	12.4
20001-30000	41	33.9
30001-50000	47	38.8
50001-70000	18	14.9

Total cost of treatment (Tk.)	Frequency	Percent
10000-20000	15	12.4
20001-30000	41	33.9
30001-50000	47	38.8
50001-70000	18	14.9
Total	121	100.0
Mean(Tk.) (± SD)	34363.64 (± 13761.015)	

Association between total direct cost and monthly family income

In this study among Tk. (5000-10000) family income of 12 (54.5%) patient's total direct cost was within Tk. (15001-25000). Among Tk. (10001-20000) family income of 28 (51.9%) patients total direct cost was within Tk. (15001-25000) and Tk. (20001-50000) family income of 20(44.4%) patients total direct cost was within Tk. (15001-25000) which was financial burden for those patients. This difference between total direct cost and family income is significant $[\chi^2_{(6)} = 15.532; p<0.05]$

Table 5 Association between total direct cost and monthly family income

Family income(Tk.)	Total Direct cost(Tk.)				Total
	9000-15000 f (%)	15001-25000 f (%)	25001-35000 f (%)	35001-50000 f (%)	f (%)
5000-10000	6 (27.3)	12 (54.5)	4 (18.2)	0 (0)	22(100)
10001-20000	6 (11.1)	28 (51.9)	13 (24.1)	7 (13)	54 (100)
20001-50000	2 (4.4)	20(44.4)	10(22.2)	13 (28.9)	45 (100)
Total	14 (11.6)	60 (49.6)	27 (22.3)	20 (16.5)	121 (100)
Significance	$\chi^2_{(6)}$= 15.532;p=0.016				

Association between total direct cost and nature of treatment

Among the patient who got radiotherapy, 11(34.4%) patient's total direct cost of treatment was Tk. (35001-50000). Among the patient who got chemotherapy, 37(62.7%) patient's total direct cost of treatment was Tk. (15001-25000). Among the patient who got both radiotherapy and chemotherapy, 12(75%) patient's total direct cost of treatment was Tk. (35001-50000). This difference between total direct cost and nature of treatment is significant $[\chi^2_{(12)} =38.371; p<0.05]$

Table 6 Association between total direct cost and nature of treatment

Nature of treatment	Total Direct cost(Tk)				Total f(%)
	9000-15000 f(%)	15001-25000 f(%)	25001-35000 f(%)	35001-50000 f(%)	
Radiotherapy	6(18.8)	8(25)	7(21.9)	11(34.4)	32(100)
Chemotherapy	3(5.1)	37(62.7)	14(23.7)	5(8.5)	59(100)
Both Radiotherapy and Chemotherapy	0(0)	12(75)	1(6.3)	3(18.8)	16(100)
Surgery and Chemotherapy	0(0)	0(0)	1(100)	0(0)	1(100)
Palliative	5(38.5)	3(23.1)	4(30.8)	1(7.7)	13(100)
Total	14(11.6)	60(49.6)	27(22.3)	20(16.5)	121(100)
Significance	$\chi^2_{(12)}$=38.371; p=.000				

Association between total direct cost and type of hospital

Among lung cancer patients who received treatment from DMCH (Government Hospital), out of them 7 (63.6%) lung cancers patient's total direct cost of treatment was (15001-25000) Tk. Among lung cancer patients who received treatment from NICRH (Government Hospital), out of them 44 (66.7%) lung cancers patient's total direct cost of treatment was Tk. (15001-25000). Among lung cancer patients who received treatment from Delta (Private Hospital), out of them 20 (45.5%) lung cancers patient's total direct cost of treatment was Tk. (35001-50000). This difference between total direct cost and type of hospital is significant [$\chi^2_{(6)}$ =56.11; p<0.05]

Table 7 Association between total direct cost and type of hospital

Type of Hospital	Direct total cost(Tk.)				Total f(%)
	9000-15000 f(%)	15001-25000 f(%)	25001-35000 f(%)	35001-50000 f(%)	
DMCH(Government)	1(9.1)	7(63.6)	3(27.3)	0(0)	11(100)
NICRH(Government)	12(18.2)	44(66.7)	10(15.2)	0(0)	66(100)
Delta(Private)	1(2.3)	9(20.5)	14(31.8)	20(45.5)	44(100)
Total	14(11.6)	60(49.6)	27(22.3)	20(16.5)	121(100)
Significance	$\chi^2_{(6)}$=56.11;p=.000				

Association between total indirect cost and sex of the patient

Among male lung cancer patients, out of them 46 (43%) lung cancers patient's total indirect cost of treatment was Tk. (10001-30000). Among female lung cancer patients, out of them 6 (42.9%) lung cancers patient's total indirect cost of treatment was Tk. (50-1000). This difference between Total Indirect cost and sex of the patients is significant   [$\chi^2_{(3)}$ =19.008; p<0.05]

Table 8 Association between total indirect cost and sex of the patient

Sex of the patient	Total indirect cost(Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
Male	15(14)	10(9.3)	36(33.6)	46(43)	107(100)
Female	6(42.9)	5(35.7)	0(0)	3(21.4)	14(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(3)}=19.008; p=.000$				

Association between total indirect cost and educational qualification of the patient

Among lung cancer patients who were illiterate out of them 12 (44.4%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). Among lung cancer patients, whose educational qualification was primary group, out of them 10 (58.8%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients whose educational qualification was secondary group, out of them 16 (43.2%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). This difference between total indirect cost and educational qualification is significant [$\chi^2_{(18)}$ =31.970; p<0.05]

Table 9 Association between total indirect cost and educational qualification of the patients

Educational qualification	Total indirect cost(Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
Illiterate	5(18.5)	4(14.8)	12(44.4)	6(22.2)	27(100)
Primary	3(8.1)	7(18.9)	11(29.7)	16(43.2)	37(100)
Secondary	3(17.6)	1(5.9)	3(17.6)	10(58.8)	17(100)
SSC	2(11.1)	1(5.6)	5(27.8)	10(55.6)	18(100)
HSC	2(14.3)	2(14.3)	4(28.6)	6(42.9)	14(100)
Graduate	3(75)	0(0)	1(25)	0(0)	4(100)
Masters	3(75)	0(0)	0(0)	1(25)	4(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(18)}=31.970; p=.022$				

Association between total indirect cost and occupation of the patients

Among lung cancer patients who were service holders, out of them 9 (36%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). Among lung cancer patients who were businessmen, out

of them 23 (62.2%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients who were farmers, out of them 14 (50%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). This difference between total indirect cost and occupation is significant [$\chi^2_{(15)}$ =63.088; p<0.05]

Table 10 Association between total indirect cost and occupation of the Patients

Occupation	Total indirect cost (Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
Service	4(16)	3(12)	9(36)	9(36)	25(100)
Business	2(5.4)	1(2.7)	11(29.7)	23(62.2)	37(100)
Farmer	1(3.6)	4(14.3)	14(50)	9(32.1)	28(100)
Housewife	5(38.5)	5(38.5)	0(0)	3(23.1)	13(100)
Unemployed	9(75)	1(8.3)	0(0)	2(16.7)	12(100)
Day-labour	0(0)	1(16.7)	2(33.3)	3(50)	6(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(15)}$=63.088;p=.000				

Association between total indirect cost and family income

In this study among Tk. (5000-10000) family income of 9(40.9%) patient's total indirect cost was within Tk. (5001-10000). Among Tk. (10001-20000) family income of 22 (40.7%) patient's total indirect cost was within Tk. (10001-30000) and Tk. (20001-50000) family income of 23(51.1%) patient's total indirect cost was within Tk. (10001-30000) which was financial burden for those patients. This difference between Total Indirect cost and Family income is significant. [$\chi^2_{(6)}$ =29.690; p<0.05]

Table 11 Association between total indirect cost and family income

Family income(Tk.)	Total indirect cost(Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
5000-10000	3(13.6)	6(27.3)	9(40.9)	4(18.2)	22(100)
10001-20000	3(5.6)	7(13)	22(40.7)	22(40.7)	54(100)
20001-50000	15(33.3)	2(4.4)	5(11.1)	23(51.1)	45(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(6)}$=29.690;p=.000				

Association between total indirect cost and age

Among lung cancer patients of (25-40) age (Year), out of them 7(50%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients of (41-59) age (Year), out of them 27(50%) lung cancers patient's total indirect cost of treatment was Tk. (10001-30000) and (60-75) age (Year), out of them 21(36.9%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). This difference between total indirect cost and age of the patient is significant $[\chi^2_{(6)} =14.704; p<0.05]$

Table 12 Association between total indirect cost and age

Age(Year)	Total indirect cost(Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
25-40	2(14.3)	4(28.6)	1(7.1)	7(50)	14(100)
41-59	6(11.1)	7(13)	14(25.9)	27(50)	54(100)
60-75	13(24.5)	4(7.5)	21(39.6)	15(28.3)	53(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(6)}=14.704; p=.023$				

Association between total indirect cost and metastases

Among lung cancer patients who had no metastases (M-o), out of them 40(44.4%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients who had metastases (M-1), out of them 11(35.5%) lung cancer patient's total indirect cost of treatment was Tk. (50-1000). This difference between total indirect cost and metastases of the patient is significant $[\chi^2_{(3)} =9.974; p<0.05]$

Table 13 Association between total indirect cost and metastases

Metastases	Total indirect cost(Tk.)				Total f(%)
	50-1000 f(%)	1001-5000 f(%)	5001-10000 f(%)	10001-30000 f(%)	
M-o	10(11.1)	11(12.2)	29(32.2)	40(44.4)	90(100)
M-1	11(35.5)	4(12.9)	7(22.6)	99(29)	31(100)
Total	21(17.4)	15(12.4)	36(29.8)	49(40.5)	121(100)
Significance	$\chi^2_{(3)}=9.974; p=.019$				

Association between cost of treatment and family income

In this study among Tk. (5000-10000) family income of 12 (54.5%)
patient's cost of treatment was within Tk. (20001-30000). Among Tk.
(10001-20000) family income of 24 (44.4%) patient's cost of treatment
was within Tk. (30001-50000) and Tk. (20001-50000) family income of
19(42.2%) patient's cost of treatment was within Tk. (30001-50000).
This difference between cost of treatment and family income is
significant $[\chi^2_{(6)} = 25.032; p<0.05]$

Table 14 Association between cost of treatment and family income

Family income(Tk.)	Cost of treatment (Tk.)				Total f(%)
	10000-20000 f(%)	20001-30000 f(%)	30001-50000 f(%)	50001-70000 f(%)	
5000-10000	6(27.3)	12(54.5)	4(18.2)	0(0)	22(100)
10001-20000	4(7.4)	21(38.9)	24(44.4)	5(9.3)	54(100)
20001-50000	5(11.1)	8(17.8)	19(42.2)	13(28.9)	45(100)
Total	15(12.4)	41(33.9)	47(38.8)	18(14.9)	121(100)
Significance	$\chi^2_{(6)}=25.032; p=.000$				

Association between cost of treatment and type of hospital

Among lung cancer patients who received treatment from DMCH
(Government Hospital), out of them 5 (45.5%) lung cancer patient's
cost of treatment was Tk. (30001-50000). Among lung cancer patients
who received treatment from NICRH (Government Hospital), out of
them 32 (48.5%) lung cancer patient's cost of treatment was Tk.
(20001-30000). Among lung cancer patients who received treatment
from Delta (Private Hospital), out of them 21 (47.7%) lung cancers
patient's cost of treatment was Tk. (35001-50000). This difference
between cost of treatment and type of hospital is significant $[\chi^2_{(6)} = 37.589; p<0.05]$

**Table 15 Association between cost of treatment and type of
hospital**

Type of Hospital	Cost of treatment (Tk.)				Total f(%)
	10000-20000 f(%)	20001-30000 f(%)	30001-50000 f(%)	50001-70000 f(%)	
DMCH(Government)	2(18.2)	4(36.4)	5(45.5)	0(0)	11(100)
NICRH(Government)	11(16.7)	32(48.5)	21(31.8)	2(3)	66(100)
Delta(Private)	2(4.5)	5(11.4)	21(47.7)	16(36.4)	44(100)
Total	15(12.4)	41(33.9)	47(38.8)	18(14.9)	121(100)
Significance	$\chi^2_{(6)}=37.589; p=.000$				

DISCUSSION

The cross sectional study was conducted in Dhaka Medical College Hospital (DMCH), Dhaka; National Institute of Cancer and Research Hospital (NICRH), Mohakhali, Dhaka; and Delta Medical College Hospital, Mirpur, Dhaka from January to December 2013. The main objective of this study was to assess the Lung cancer patients to know about their financial burden.

Of all cancer, Lung cancer is more common but prognosis is not so good. Treatment is expensive and patient's financial burden is increasing to maintain this treatment. In this study 121 Lung cancer patients were interviewed.

The economic burden of cancer is defined by evaluation of the direct and indirect costs incurred by patients and society as a whole. The direct costs reflect the value of services for diagnosis, treatment and up to end of life issues. These include the costs of care provided by physicians and other health care professionals, care provided in hospitals and other health care institutions, drugs, laboratory services and research. The indirect costs represent the reduced productivity associated with lost or impaired ability to work because of illness and the loss of economic productivity because of premature death.

In this study majority of the data were collected from NICRH 66(55%) than from Delta hospital 44(36%) and from DMCH 11(9%).

The study revealed that out of 121 lung cancer patients, most i.e. 107 (88.4%) of the patients were male. American Cancer Society said that culminated by mid-century with lung cancer becoming the leading cause of cancer death among men.

The mean age of the patients was 51(±10.781) years. It was found that 54(44.6%) of the patients were from age group 41-59. The study revealed that out of 121 lung cancer patients, most i.e. 107 (88.4%) of the patients were male and the rest i.e. 14(11.6%) were female. American Cancer Society said that culminated by mid-century with lung cancer becoming the leading cause of cancer death among men.

In this study Mean (± SD) month for how long ago lung cancer was diagnosed was 7.23 (±7.859). Majority of the cases 87(71.9%) were diagnosed within 1-7 months. Rest of the cases were diagnosed within 8-14 months and 15-24 months and number of cases were 24(19.8%)

and 10(8.3%). Majority of the primary lung cancer cases survived 6-7 months. That's why this group were more.

In this study majority of the patient was first diagnosed as a lung cancer in chamber of specialist doctor 48(39.7%), 44(36.4%) were in government hospital, 27(22.3%) were in private hospital and 2(1.7%) were in abroad. In our country people are not habituated with regular health check up, so when they become sick and consult with specialist doctor then affected are diagnosed.

In this study majority of the patient started for treatment of lung cancer in Private hospital 46(38%).Rest of them started from Government hospital 43(35.5%), NGO hospital 13(10.7%), Chamber of specialist doctor 13(10.7%) and Homeopath 6(5%). Majority of the people started treatment in private hospital to get well soon. But in private hospital treatment cost is high and patient cannot maintain treatment cost at last.

In this study average cost of treatment was Tk. 34363.64(±SD13761.015). Majority of 47(38.8%) patients bore cost for treatment within Tk. 30001-50000, 41(33.9%) were within Tk. 20001-30000, 18(14.9%) were within Tk. 50001-70000 and 15(12.4%) were within Tk. 10000-20000**.** In a study National Research Council (2008) showed that annually each lung cancer patients cost of treatment in UK healthcare system £9,071.

In this study among Tk. (5000-10000) family income of 12 (54.5%) patient's total direct cost was within Tk. (15001-25000). Among Tk. (10001-20000) family income of 28 (51.9%) patient's total direct cost was within Tk. (15001-25000) and Tk. (20001-50000) family income of 20(44.4%) patient's total direct cost was within Tk. (15001-25000) which was financial burden for those patients. This difference between total direct cost and family income was significant [$\chi^2_{(6)}$ = 15.532; p<0.05]. Lung cancer treatment cost was very high, so middle and low income group people fall in financial burden to maintain treatment cost.

Among the patient who got radiotherapy, 11(34.4%) patients total direct cost of treatment was Tk. (35001-50000). Among the patient who got chemotherapy, 37(62.7%) patients total direct cost of treatment was Tk. (15001-25000). Among the patient who got both radiotherapy and chemotherapy, 12(75%) patients total direct cost of treatment was Tk. (35001-50000). This difference between total direct

cost and nature of treatment was significant [χ^2 (12) =38.371; p<0.05]. Chemotherapy is more costly treatment pattern other than treatment pattern of lung cancer, so patient who takes chemotherapy causes increase total direct treatment cost of patient which increase financial burden.

Among lung cancer patients who received treatment from DMCH (Government Hospital), out of them 7 (63.6%) lung cancers patient's total direct cost of treatment was Tk. (15001-25000). Among lung cancer patients who received treatment from NICRH (Government Hospital), out of them 44 (66.7%) lung cancers patient's total direct cost of treatment was Tk. (15001-25000). Among lung cancer patients who received treatment from Delta (Private Hospital), out of them 20 (45.5%) lung cancers patient's total direct cost of treatment was Tk. (35001-50000).This difference between total direct cost and type of hospital was significant [χ^2 (6) =56.11; p<0.05]. Treatment in private hospital causes more financial burden than government hospital due to more treatment cost in private hospital.

Among male lung cancer patients, out of them 46 (43%) lung cancers patients total indirect cost of treatment was Tk. (10001-30000). Among female lung cancer patients, out of them 6 (42.9%) lung cancers patients total indirect cost of treatment was Tk. (50-1000). This difference between total indirect cost and sex of the patients was significant [χ^2 (3) =19.008; p<0.05]

Among lung cancer patients who were illiterate, out of them 12 (44.4%) lung cancers patients total indirect cost of treatment was Tk. (5001-10000). Among lung cancer patients whose educational qualification was primary group, out of them 10 (58.8%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients whose educational qualification was secondary group, out of them 16 (43.2%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). This difference between total indirect cost and educational qualification was significant [χ^2 (18) =31.970; p<0.05]

Among lung cancer patients who were service holders, out of them 9 (36%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). Among lung cancer patients who were businessmen, out of them 23 (62.2%) lung cancer patient's total indirect cost of

treatment was Tk. (10001-30000). Among lung cancer patients who were farmers, out of them 14 (50%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). This difference between total indirect cost and occupation was significant [$\chi^2_{15)}$ =63.088; p<0.05]

In this study among Tk. (5000-10000) family income of 9(40.9%) patient's total indirect cost was within Tk. (5001-10000). Among Tk. (10001-20000) family income of 22 (40.7%) patient's total indirect cost was within Tk. (10001-30000) and Tk. (20001-50000) family income of 23(51.1%) patient's total indirect cost was within Tk. (10001-30000) which was financial burden for those patients. This difference between total indirect cost and family income was significant. [$\chi^2_{(6)}$ =29.690; p<0.05]

Among lung cancer patients of (25-40) age (Year), out of them 7(50%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patient's of (41-59) age (Year), out of them 27(50%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000) and (60-75) age(Year), out of them 21(36.9%) lung cancer patient's total indirect cost of treatment was Tk. (5001-10000). This difference between total indirect cost and age of the patient was significant. [$\chi^2_{(6)}$ =14.704; p<0.05]

Among lung cancer patients who had no metastases (M-o), out of them 40(44.4%) lung cancer patient's total indirect cost of treatment was Tk. (10001-30000). Among lung cancer patients who had metastases (M-1), out of them 11(35.5%) lung cancer patient's total indirect cost of treatment was Tk. (50-1000). This difference between total indirect cost and metastases of the patient was significant. [$\chi^2_{(3)}$ =9.974; p<0.05]

In this study among Tk. (5000-10000) family income of 12 (54.5%) patient's cost of treatment was within Tk. (20001-30000). Among Tk. (10001-20000) family income of 24 (44.4%) patient's cost of treatment was within Tk. (30001-50000) and Tk. (20001-50000) family income of 19(42.2%) patient's cost of treatment was within Tk. (30001-50000). This difference between cost of treatment and family income was significant [$\chi^2_{(6)}$=25.032;p<0.05]

Among lung cancer patients who received treatment from DMCH (Government Hospital), out of them 5 (45.5%) lung cancer patient's cost of treatment was Tk. (30001-50000). Among lung cancer

patients who received treatment from NICRH (Government Hospital), out of them 32 (48.5%) lung cancer patient's cost of treatment was Tk. (20001-30000). Among lung cancer patients who received treatment from Delta (Private Hospital), out of them 21 (47.7%) lung cancers patient's cost of treatment was Tk. (35001-50000). This difference between cost of treatment and type of hospital was significant [χ^2 (6) =37.589; p<0.05]. Treatment in private hospital causes more financial burden than government hospital due to more treatment cost in private hospital.

CONCLUSION

Lung cancer is a major public health problem for both developed and developing countries. Though lung cancer prognosis is not so good but treatment cost is very high. This cross-sectional study was conducted among 121 lung cancer patients in Dhaka Medical College Hospital (DMCH), Dhaka; National Institute of Cancer and Research Hospital (NICRH), Mohakhali, Dhaka; and Delta Medical College Hospital, Mirpur, Dhaka.Most of the patients were middle age group. Most of the patient was male and Muslim. Majority of the patient were married. Majority of the patients had primary level education. Majority of lung cancer patients were business men. Majority of them were from middle income group. In this study majority of the patient was first attended in chamber of specialist doctor. In this study majority of the patient at first took treatment of lung cancer in Private hospital. Majority of the patients maintained their total treatment cost from household savings. Majority of the patient had no metastases and grading was grade-2. Most of the patient received chemotherapy. Association between total direct cost and family income, nature of treatment, type of hospital are statistically significant(χ^2, p<0.05). Association between total indirect cost and educational qualification, occupation, family income, age, metastases are statistically significant(χ^2, p<0.05). Association between cost of treatment and family income, type of hospital are also statistically significant [χ^2, p<0.05]. There need to take measure for minimize the treatment cost of patient. Thus patient's financial burden will decrease and can lead a quality life.

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