CT Guided Biopsy, Fine-Needle Aspiration (FNAC) Result Analysis and Various Symptoms for the Diagnosis of Lung Cancer in Kashmiri Population

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Abstract
Lung cancer is most common cancer worldwide representing approximately 12.7% of all new cancers and 18.2% of all cancer related deaths, throughout the world. In India, it is the commonest and the leading cause of cancer related mortality in both men and women. Most patients have been found to be in the advanced stage of the disease. It is the most lethal cancer among males accounting for 10.9% of all cancer cases and 13% of cancer related mortality. Human pulmonary neoplasms can be subdivided into two major forms: non-small cell cancers and small cell cancers. Non-small cell lung cancer (NSCLC) accounts for 80% of all lung cancer cases. The non-small cell cancers include adenocarcinoma, squamous cell carcinomas, large cell carcinomas, and adenosquamous cell carcinomas. Adenocarcinoma has become the most important form of lung cancer over the past 20 years with both a relative and an absolute increase in incidence rates. In most of the developed countries, it has become the dominant histological type of lung cancer. It has also overtaken squamous cell carcinoma as the most common form of lung cancer among males in some countries while it has continued to be the commonest type among females. This histological shift has been linked to changes in the smoking habits of the population in these regions as well as in the design and composition of cigarette being marketed therein. Specific signs, symptoms and radiological criteria for diagnosis of the patients who were suspected for Lung cancer and all patients were diagnosed by CT- guided biopsy, branchioscopy and FNAC. In this hospital based analytical study an attempt was made to correlate clinical and radiological profile of suspected case of lung cancer with CT-Guided FNAC/biopsy. Though the clinical symptoms were not specific, CT-guided FNAC/biopsy proved to be valuable in confirmation of diagnosis of lung cancer and histopathology proved to be a diagnostic tool for almost all suspected.
Keywords: CT-Guided FNAC, branchioscopy, FNAC, adenocarcinoma.

Introduction

Lung cancer is one of the commonest cancers and the leading cause of cancer related mortality worldwide (Jemal *et al.*, 2011). In the beginning of the century, lung cancer was considered to be rare (Nath *et al.*, 1935). But now, it has reached epidemic proportions. This is the leading cause of cancer death in developed countries and is rising at alarming rates in developing countries (Khuri *et al.*, 2001). It accounts for 12.7% of all new cancer cases and 18.2% of all cancer related deaths, throughout the world. In India, it is the commonest and the leading cause of cancer related mortality in both men and women (Brambilla *et al.*, 2001; Hussain *et al.*, 2010). It is the most lethal cancer among males accounting for 10.9% of all cancer cases and 13% of cancer related mortality (Parkin., 2008). According to National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) 2010 report, lung cancer is the second most common cancer worldwide, in both males (accounting 15% of all cancer) and females (accounting for 14% of all cancer) and it is the most common cause of cancer death worldwide (Long., 2012).

Compared to western population, epidemiological study shows there is an increased prevalence of lung cancer in the Indian population (Rawat *et al*., 2009). In India, approximately 63,000 new lung cancer cases are reported each year (Ganesh *et al.,* 2011).

Lung cancer was reported to be the second most common malignancy in an earlier hospital based study from Kashmir valley (Shah *et al.,* 1990), the first being cancer of the upper gastrointestinal tract (Shah *et al.,* 1990; Dhar *et al.,* 1993). However, a recent study shows that Srinagar, the summer capital of Jammu & Kashmir has the highest incidence of lung cancer among males in India (Koul *et al*., 2010).

Human pulmonary neoplasms can be subdivided into two major forms: non-small cell cancers and small cell cancers. Non-small cell lung cancer (NSCLC) accounts for 80% of all lung cancer cases. The non-small cell cancers include adenocarcinoma, squamous cell carcinomas, large cell carcinomas, and adenosquamous carcinomas. Adenocarcinoma has become the most important form of lung cancer over the past 20 years with both a relative and an absolute increase in incidence rates. In most of the developed countries, it has become the dominant histological type of lung cancer (Jindal *et al.,* 1990). It has also overtaken squamous cell carcinoma as the most common form of lung cancer among males in some countries while it has continued to be the commonest type among females (Little *et al.,* 2007). This histological shift has been linked to changes in the smoking habits of the population in these regions as well as in the design and composition of cigarette being marketed therein (Alberg *et al*., 2007). We take only specific signs, symptoms and radiological criteria for patients who were suspected for Lung cancer and all patients were diagnosed by CECT- guided biopsy, branchioscopy and FNAC. The aim of the peresent study is to diagnose lung cancer through the CT-Guided FNAC.

Materials and Methods

Study design and method

Patients enrolled: 50 patients were enrolled in the study and most of them were above 30 years age with clinical symptoms of cough since 20 days, hemoptysis, fever, weight loss, dyspnea and hoarseness of voice and/or with any radiological features like space occupying lesion, hilar prominence, mediastinal widening and collapse with consolidation. These cases with above criteria were subjected to CT guided biopsy /FNAC and branchioscopy.

Results

The demographic profile revealed that in our study 50 patients who were suspected for lung malignancy due their clinical signs and symptoms with positive radiological findings in favour of lung cancer, all the 50 patients were diagnosed histopathologically as lung cancer by CT-guided biopsy/ FNAC. Most of the malignant patients were above age of 40 years and patients with malignancy were presented with average age 58.94 years, most of the patients were within range of 50 to 84 years.

In malignant cases (50), 40 patients were male and remaining 10 patients were females (Table. 1). Most of the patients with lung cancer 17 were farmer, 10 were house wives, 13 were from service class and rests of the patients were drivers, shopkeepers, labours.

Most of the patients who were suspected for lung cancer in study were smokers 35; only small number of patients non-smokers.

The patients which were suspected of having lung cancer presented with cough which was the major symptom (42 out of 50) and all patients diagnosed as having lung cancer were presented with cough. Other major symptoms beside cough were dyspnea and weight loss 74%, 44% were having Haemoptysis and 40% were having chest pain. 38% patients were having fever and 20% patients complain of Hoarseness of voice.

We took only specific signs, symptoms and radiological criteria for patients who were suspected for Lung cancer and all patients were diagnosed by CT- guided FNAC/biopsy. Among all suspected cases, all the 50 cases were diagnosed histopathologicaly as malignant and no cases has been found non – malignant. In diagnosed malignant

cases non small cell lung carcinoma was almost found in all cases. In NSCLC type Lung cancer adeniocarcinoma was most common (80%) and squamous cell carcinoma second most common type of non small cell Lungs cancer (20%). FNAC/biopsy taken in all suspected patients with CT-guided. It was conclusive in 49 patients and inconclusive in one patient. FNAC/Biopsy was conclusive in 98% of patients, so CT-guided FNAC is valuable procedure regarding diagnosis of lung cancer though lung biopsy remain gold standard procedure for definitive diagnosis.

Table 1. Demographic characteristics of lung cancer patients

S.No	Variables	Year Nov 2013 To June 2014
1.	Total Cases	50
2.	Mean Age	58.94
3.	Sex	
	1. Male	40
	2.Female	10
4.	Male :Female	4
5.	Rural : Urban	1.5
6.	Occupation	
	1.Farmers	17
	2. Service class	13
	3. House wife	10
	4. Others	10
7.	Diagnosis	
	1. CT Guided Biopsy/FNAC	47
	2. Branchioscopy	03
	3. Both	06
8.	Histological type	
	1. Adenocarcinoma.	42
	a)Male	33
	b) Female	09
	2. Squamous Cell Carcinoma	08
	a)Male	07
	b) Female	01
9.	Symptoms:	
	a) cough	42
	b) cough+ dyspnea +weight loss	37
	c) Haemoptysis.	22
	d) Chest pain.	20
	e) Fever.	19
	f) Hoarseness of voice.	10
10.	Smoking:	
	a) Smokers	35
	b) Non smokers	15

Discussion

Lung cancer is the most frequent malignant disease and the most common cause of cancer death in the world. However, the clinical profile of lung cancer in India was ifferent from the west, in that Indian patients present almost 15-20 years earlier in the 5^{th} or 6^{th} decades of life (Parkin *et al*., 2005). However, a recent study shows that Srinagar, the summer capital of Jammu & Kashmir has the highest incidence of lung cancer among males in India (Koul *et al*., 2010).

Adenocarcinoma has become the most important form of lung cancer over the past 20 years with both a relative and an absolute increase in incidence rates. In most of the developed countries, it has become the dominant histological type of lung cancer (Jindal *et al., 1990)*. It has also overtaken squamous cell carcinoma as the most common form of lung cancer among males in some countries, while it has continued to be the commonest type among females. In present study we found that adenocarcinoma is gradually becoming prominent subtype among males in kashmir valley. Majority of lung cancer cases have been convincingly proven to be associated with smoking habits. Of all lung cancer deaths in world 85% are attributed to tobacco smoking, which contain harmful carcinogens. This study shows the clinicoradiological profile of suspected cases and views the most common clinical, radiological and pathological profile of lung cancer in SKIMS Soura.

The lung cancer was predominantly seen in males, who were accounted for 80%. The male female ratio was 4 in this study. This finding has been consistent with the other studies in India, that the lung cancer is predominantly seen in male. Jindal & Behera., (1990) reported the sex ratio as 4.5 whereas Kashyap *et al.*, (2001) reported sex ratio in lung cancer was 6.17. It has been reported as low as 2.9 by Jha *et al.*, (1972).

As in this study we found high male female ratio showing less awareness about the health in females. This study also shows that there is less awareness in farmers about health and major reason of malignancy in the farmers was higher smoking habit of cigarette and Hukka than the urban one.

A significant proportion of the cases in the study were within range of 50-70 years (68%) the mean age was 58.9 years, and one patient with minimum age (28 yrs.) Who was diagnosed as adenocarcinoma, but he was associated with neck pain and Gout. Jindal and Behera., (1990) reported mean age 54.3 years whereas Gupta *et al*., (2001) and Kashyap *et al*.,(2003) reported mean age at presentation as 60 and 54.6 years respectively. This observation reconfirmed the established fact of increasing incidence of lung cancer as the age advances and need of detailed evaluation of elderly patients who present features suggestive of lung cancer.

In this study we include all suspected cases with clinical and radiological specified criteria's which include smoking. We found that patients who have history of smoking 35patients (70%) were malignant and 15 cases were malignant form without history of smoking (30%). This is showing increasing malignancy in non smoker patients also. It indicates increase in air pollutions, either by motor vehicle or by factories or by aerosolized fumes in kitchen particularly in females.

In the patients who were diagnosed as malignt (50), the maximum patients were smokers with smoker to nonsmoker ratio 2.3. Jindal and Behera., (1990) reported ratio as 2.7. While Arora *et al*., (1990) reported the ratio was 1.2, nonetheless lung cancer has been prominently seen in smokers in each of the previous and in this study also.

There are important differences in the clinical spectrum of lung cancer patients in India compare to those in the west Jindal and Behera., (1990) . Most of the patients have advanced disease at the time of diagnosis.

Most common symptom experienced by our patients was cough associated with 42 patients who were suspected for lung cancer. The next most common symptom reported were dyspnea and weight loss (74%). 44% were having blood in sputum and 40% were having chest pain, 38% were having fever and 20%. patients were complaining of hoarseness of voice.

Most common radiological finding in lung cancer patients of this analytical study was space occupying lesion (mass) which was found in 65% of all malignant patients (33). It was right side in 25 patients (75.75% and left side

in remaining 8 patients (24.25%). The space occupying lesion was more commonly seen in right lung and in upper zone. Others major radiological finding was Pleural effusion in 12 patients (24%).

In the same study of 336 patients with bronchogenic carcinoma carried out in Chandigarh by Jindal *et al.,* (1990), commonest finding was opacity with or without collapse (64%) and pleural effusion (23%). In a study by Jagdish *et al.,* (2009) mass lesion was reported in 46.31% cases, collapse-consolidation 40.89 and pleural effusion in 4.43% cases. There is wide variability in these observations in different studies; however the finding of a mass lesion at the time of diagnosis of lung cancer is high.

This shows how a lung cancer lesion grows to such extent and cause symptoms when it is of significant size and probably has metastasized already by the time of diagnosis.

Finally out of all NSCLC cases 20% patients had squamous cell carcinoma (10), 80% had adenocarcinoma (40). Thus Adenocarcinoma was more frequently diagnosed than any other form of lung cancer. But seconds most common was Squamous cell carcinoma. This is showing the increasing of adenocarcinoma subtype of lung cancer in Kashmir as in rest of the India as well as in Western countries.

In other Indian studies Jagdish Rawat *et al.,* (2009) studied 203 cases of lung cancer. They reported Squamous cell carcinoma in 91(44.83%), Adenocarcinoma in 40(9.70%), Large cell carcinoma in 17(8.37%), Undifferentiated carcinoma in 21(10.34%) and small cell carcinoma in 34 (16.75%) cases. Jindal and Behera., (1990) in their study reported incidence of squamous cell carcinoma 34.3%, Adenocarcinoma 25.9%, small cell carcinoma 20.3% and large cell carcinoma in 7.3%. In another study by Navneet *et al.,* (2010) reported incidence of Squamous cell carcinoma 34.8%, Adenocarcinoma 26%, small cell carcinoma 18.4% and other in 20.8%. This study in Kashmir by Khan *et al.,* (2006) found incidence of Squamous cell carcinoma to 48 (77.3%), Small cell carcinoma 55 (17.1%), Adenocarcinoma 17(5.3%) and Large cell carcinoma 1(0.31%).

There is a variation in histological diagnosis in these previous studies; however squamous cell cancer has been the most common histological type of lung cancer in India as shown by these studies.

In present study the most histological diagnosis came out to be Adenocarcinoma in 84% of the patients.

The same variation in present and previous studies may be due to including of all suspected cases than others in which studies were done in already diagnosed cases.

The most histological type in smoker and non smoker was adenocarcinoma, which is 83.33% and 16.66% respectively. In male patients adenocarcinoma was the most common diagnosis in which majority was smokers.

In female most common type was adenocarcinoma (21.42%). Navneet *et al*.,(2010) reported the incidence of squamous cell carcinoma in smokers as 38.5% and adenocarcinoma as a most common histological type in non smokers was 46.3% cases.

Conclusions

In this hospital based analytical study an attempt was made to correlate clinical and radiological profile of suspected case of lung cancer with CT-Guided FNAC/biopsy. Though the clinical symptoms were not specific, CT-guided FNAC/biopsy proved to be valuable in confirmation of diagnosis of lung cancer and histopathology proved to be a diagnostic tool for almost all suspected. The Radiological guided FNAC made the histology an easier procedure. The result in this study is close to earlier studies in terms of clinical presentation and features. Majority of patients having adenocarcinoma, were male and smokers. Squamous Cell Carcinoma was also diagnosed in higher percentage of patients.

The main limitation of this study was small size of study population, In view of this the result may not be a true presentation of the trends in general population so more studies are required to confirm the result.

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