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Original Research Article

Lung cancer: 1 year experience at tertiary care centre with reference to cytodiagnostic approach

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ABSTRACT

Background: Lung cancer is the most common cancer incidence wise as well as leading cause of cancer related death in worldwide as well as in India. Cytological diagnosis plays an important role in patients having lung cancer. This study was conducted to evaluate sensitivity of various cytological methods in diagnosis of lung cancer, to study typing of lung cancer, age and gender wise distribution of lung cancer and its association with smoking.
Methods: This study includes patients having clinical and radiological diagnosis of lung cancer. Total 150 cases of entire January 2015 to December 2015 are included. Methods obtaining samples includes, abrasive cytology by bronchoscope guided: bronchoalveolar lavage (BAL); brush cytology and bronchial washing, CT/USG guided transthoracic fine needle aspiration, trans- bronchial needle aspiration. Samples have been processed as per standard protocols and cytomorphology of samples are studied, along with these patient age, gender, and smoking habit have been recorded.
Results: Sensitivity of various method: abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing, trance bronchial needle aspiration, CT/USG guided transthoracic fine needle aspiration is 70%, 66%, 90% respectively. Adenocarcinoma is most common carcinoma followed by squamous carcinoma, having incident of 41%, 31.39% respectively. In male patient peak age is 5th decade, and in female peak age is 6th decade. Male:female ratio is 5.1:1. Adenocarcinoma is most common carcinoma is 10 times more common in non-smokers as compare to squamous cell carcinoma .But association of squamous cell carcinoma with smoking is 97%.
Conclusions: CT/USG guided transthoracic fine needle aspiration method has highest sensitivity. In male patients peak age of presentation of lung carcinoma is 5th decade, and in female patient's peak age is 6th decade. Lung carcinoma found to be more common in males than in females. Adenocarcinoma is most common carcinoma. It is 10 times more common in non-smokers as compare to squamous cell carcinoma. Association of squamous cell carcinoma with smoking is 97%.

Keywords: Cytological methods, Lung carcinoma, Typing of lung carcinoma

INTRODUCTION

Carcinoma of lung is major continuing oncologic problem with increasing incidence and cancer related mortality in world as well as in India. According to GLOBOCON 2008, lung cancer accounts for 10.9% in male, 2.2% in female and mortality rate in males and females are13% and 3.3% respectively.[1] This dismal mortality makes diagnosis of lung cancer utmost important. Cytology plays an important role in initial

evaluation and diagnosis of lung cancer. Flexible fibreoptic bronchoscopy revolutionized the cytological diagnostic techniques in lung cancer in modalities like bronchoalveolar lavage (BAL), brush cytology and bronchial cytology.[2] Great advances in minimally invasive and radiographically guided sampling procedures have elevated stature of cytology in diagnosis of lung cancer.[3] Typing of lung cancer on basis of cytomorphology has been studied. This study is conducted to evaluate yield of various cytological methods in diagnosis of lung cancer, to study typing of lung cancer, age and gender wise distribution of lung cancer and its association with smoking.

METHODS

The present study was carried at department of cytopathology with collaboration of department of TB and chest in G.G.H Hospital. Total 150 cases from January 2015 to December 2015 are included.

Inclusion criteria

All clinically suspected patients of lung carcinoma after routine investigation with posterioranterior and lateral view radio graph, haemogram, urine analysis, microbiological and cytological examinaton of sputum.

Exclusion criteria

Patients with

- Severe bullous emphysema
- Pneumothorax
- Suspected vascular shadow
- Bleeding disorder
- Uremia.

Methods obtaining samples include abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing, and radiographically CT/USG guided transthoracic fine needle aspiration, trans bronchial needle aspiration. Samples have been processed as per standard protocols and cytomorphology of samples are studied. Typing was done. Bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing was done in 60 patients. CT/USG guided transthoracic fine needle aspiration was done in 87 patients, trans bronchial needle aspiration was done in 3 patients. Simultaneously patient's age, gender, and history of smoking were taken.

RESULTS

Comparison of yield of various cytological procedures

Bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing was done in 60 patients amongst which 42 (70%) were positive for lung carcinoma. Trance bronchial needle aspiration was done in 3 patients among whom 2 (66.66%) patients were positive. CT/USG guided transthoracic fine needle aspiration was done in 87 patients among whom 78(90%) patients were positive. So CT/USG guided transthoracic fine needle aspirations have highest yield of 90%. In 28 patients out of 150 patients cytological procedures were inconclusive for lung carcinoma diagnosis (Table 1).

Table 1: Comparison of yield of various cytological procedures.

Procedure	Total case	Positive	Sensitivity
Bronchoscopy guided brush and bal cytology	60	42	70%
Trance bronchial needle aspiration	3	2	66%
USG/CT guided trance thoracic FNAC	87	78	90%
Total	**150**	**122**	

Table 2: Distribution of different type of lung cancer.

Type	Male	Female	Total
Adenocarconoma	43	8	51 (41.80%)
Squamous cell carcinoma	38	1	39 (31.96%)
Large cell carcinoma	1	0	1 (0.82%)
Non-small cell carcinoma	8	2	10 (8.12%)
Small cell carcinoma	7	7	14 (11.47%)
Metastasis	4	2	6 (4.92%)
Other	1	0	1 (0.82)
Total	**102**	**20**	**122**

Distribution of different type of lung cancer

Adenocarcinoma is the most frequent type observed in 51 (41.80%) patients, followed by squamous cell carcinoma in 39 (31.96%) patients. in 10cases (8.12%) only non-small cell carcinoma have been given as typing was not possible by cytomorphological examination. small cell carcinoma in 14 patients (11.47%), metastasis in 6 patients (4.92%) observed. So adenocarcinoma is the most common type in lung carcinoma.

Table 3: Age and gender wise distribution.

Age	Male	Female
<40year	2	0
41-50	8	0
51-60	45	5
61-70	35	10
>70	12	5
Total	**102 (83.60%)**	**20 (17.40%)**

Age and gender wise distribution

Lung carcinoma is more common in male patients as compare to female patients. Male:female ratio is 5.1:1. In male patient peak age of lung carcinoma is 5th decade (51 to 60years) and in female peak age is 6th decade (61 to70 years). So in male patients peak age of lung carcinoma is one decade earlier. In male patients there are 2 cases of lung carcinoma presented below age of 40 years (Table 3).

Typing of carcinoma with reference to smoking habit

Adenocarcinoma is most common carcinoma. It is 10 times more common in non-smokers as compare to squamous cell carcinoma. Association of squamous cell carcinoma with smoking is 97% (Table 4).

Table 4: Typing of carcinoma with reference to smoking habit.

Type	Smoker	Nonsmoker	Total
Adenocarconoma	41(42.27%)	10 (40%)	51
Squamous cell carcinoma	38 (39.16%)	1 (4%)	39
Large cell carcinoma	0 (00.00)	1 (4%)	01
Non small cell carcinoma	7 (7.22%)	3 (12%)	10
Small cell carcinoma	7 (7.22%)	7 (28%)	14
Metastasis	3 (3.09%)	3 (12%)	06
Other	1 (1.03%)	0 (00.00%)	01
Total	**97**	**25**	**122**

DISCUSSION

Present study shows sensitivity of various methods: abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing, trance bronchial needle aspiration, CT/USG guided transthoracic fine needle aspiration is 70%, 66%, 90% respectively. Adenocarcinoma is most common carcinoma followed by squamous carcinoma, having incident of 41%, 31.39% respectively. In male patient peak age is 5th decade, and in female peak age is 6th decade .Male: Female ratio is 5.1:1.

Adenocarcinoma is most common carcinoma. It is 10 times more common in non-smokers as compare to squamous cell carcinoma. Association of squamous cell carcinoma with smoking is 97% and with adenocarcinoma 80%. The present study is compared with various other studies.

Yield of abrasive cytology by bronchoscope guided bronchoalveolar lavage(BAL);brush cytology and bronchial washing and CT/USG guided transthoracic fine needle aspiration method is 76.92% and 92.3% in Bhattacharjee S et al.[2] Yield of abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing and CT/USG guided transthoracic fine needle aspiration method is 69.6% and 99% in Kumar P et al study.[3] Results of both studies are comparable with present study which has yield of abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing and CT/USG guided transthoracic fine needle aspiration method is 70% and 90%. Most prevalent age groups in lung carcinoma in Banset et al study is 6th decade, Sarker et al is 46-55 year in present study most prevalent age group in male is 5th decade and in female is 6th decades.[4,5] Male:female ratio in Banset et al 2.15:1, Sarkar et al is 3.3:1 and in present study ratio is 5.1:1.[4,5]

Table 5: Comparison of various studies for typing of lung carcinoma.

Study	Basnet et al[4]	Sarkar et al[5]	Rangawamy[6]	Present
Total cases	48	61	47	122
Squamous carcinoma (%)	45.83	47.54	37	41.80
Adenocarcinoma (%)	25	26.23	38	31.96
Large cell carcinoma (%)	2	4.9	8	00.82
Non-small cell carcinoma (%)	9	-	4	8.12
Small cell carcinoma (%)	10	9.8	17	11.47
Metastatic (%)	2	11.4	-	4.92
Other (%)	1	-	-	0.82

Comparison of various studies for typing of lung carcinoma

In Banset et al study and sarker et al most common carcinoma is squamous cell carcinoma followed by adenocarcinoma, present study and Rangaswamy et al study show adenocarcinoma is most common carcinoma followed by squamous carcinoma (Table 5).[4-6]

CONCLUSION

Yield of abrasive cytology by bronchoscope guided bronchoalveolar lavage (BAL); brush cytology and bronchial washing, trance bronchial needle aspiration, CT/USG guided transthoracic fine needle aspiration is 70%, 66%, 90% respectively. Adenocarcinoma is most common carcinoma followed by squamous carcinoma, having incident of 41%, 31.39% respectively. In male patient peak age is 5th decade, and in female peak age is 6th decade. Male:female ratio is 5.1:1.

Present study showed higher incidence of adenocarcinoma than squamous cell carcinoma; possibly due to exposure to pollution and small scale study. So to support this conclusion of present study large scale study and cohort study is required.

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Ethical approval: The study was approved by the institutional ethics committee

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