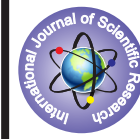


CORRELATION OF CYTOLOGY WITH CORE BIOPSY IN LUNG CARCINOMAS.



Pathology

KEYWORDS: : FNAC, Bronchial wash and brush, lung biopsy, lung carcinoma.

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ABSTRACT

Lung cancer is one of the leading causes of cancer deaths in the world. The rate of early diagnosis is increased with the availability of newer imaging modalities and pathology studies. Current study was planned to compare various cytological methods with transbronchial/CT guided lung biopsy and an attempt was made to detect whether combination of different methods will yield better results. A descriptive study was conducted over a period of 1 year. A total of 97 cases in which the radiological and bronchoscopic evaluations were suggestive of malignancy and the biopsy became positive were included in the study. Most common histological type was adenocarcinoma (44.3%). In 54 cases bronchial wash and brush were done along with endoscopic biopsies. In 43 cases CT guided FNAC results were compared with histopathology of CT guided biopsies. Combined evaluation of samples obtained by different methods helps to arrive at a more accurate diagnosis.

INTRODUCTION

Lung cancer is one of the leading causes of cancer related deaths in the world (1). The increasing incidence is due to various factors like smoking and pollution. With the availability of different imaging modalities like CT, MRI and different techniques like bronchoscopy along with bronchial wash and brush cytology, and endobronchial or transbronchial biopsy; the rate of early diagnosis is also increased. Each modality is important but not sufficient on its own (2). Bronchoscopy is the most valuable tool for lung cancer. It helps to identify endobronchial lesions and also peribronchial lesions with air way compression. Samples from the lesion can be collected by methods like bronchial washing, brushing, needle aspiration and biopsies. Combined evaluation of samples obtained by different methods helps to arrive at the pathology with more accuracy (3).

Cytological studies are often the initial diagnostic techniques carried out in a patient with suspected lung lesion (4). Bronchial wash and brush are very helpful in the diagnosis of lung carcinomas.

FNAC is a simple, safe and reliable technique for the diagnosis of pulmonary lesions particularly with the help of CT scan, even peripheral lesions can be sampled. It also helps in typing the cancer. Among various techniques bronchial biopsy has the highest sensitivity for endobronchial malignant lesions (5). It can also be used as the gold standard diagnostic test to assess the efficiency of various cytological techniques (6).

The current study was planned with the objective of comparing the various cytological techniques in the form of bronchial wash, brush and CT guided FNAC with the biopsy. An attempt is also made to determine whether a combination of various methods have got more accuracy compared to a single procedure.

AIM

Correlation of histology and cytology in lung carcinomas.

METHODS

A descriptive study was conducted in the department of pathology at Amala Institute of Medical Science, Thrissur over a period of 1 year starting from July 2013 to July 2014. A total of 97 cases in which the radiological and bronchoscopic evaluations were suggestive of malignancy and the biopsy turned out to be positive were included in the study. The biopsy reports were compared with the cytological studies, either bronchial wash and brush or FNAC. The cytological samples were obtained along with the biopsies. Two types of biopsies were taken, either endobronchial or CT guided. Bronchial wash and brush were followed by endobronchial biopsies and FNACs were

followed by CT guided biopsies. The biopsies were fixed in 10% formalin, processed and stained with Haematoxylin and eosin. The cytology samples were centrifuged, made into smears and stained with Papinicolaou and Giemsa stains.

RESULTS

Out of the 97 cases most common histological type was adenocarcinoma (44.3%), followed by squamous cell carcinoma (23.7%) and small cell carcinoma (19.6%). 5.2% of cases were reported as non small cell carcinoma and 2.1% of cases were reported as poorly differentiated neoplasm or positive for atypical cells. 4.1% of cases were metastasis from other sites and 1 case was histologically anaplastic carcinoma. There were 73 males and 24 females. Age of the patients ranged from < 20 years to > 80 years. Majority of the patients were between 61-80 years range. Most common site was right upper lobe followed by left lower lobe and left middle lobe.

In 54 cases bronchial wash and brush were done along with endoscopic biopsies. In 74.1% of cases bronchial wash was negative/inadequate and in 38.9% of cases bronchial brush was negative/inadequate. The frequency of detection of squamous cell carcinoma was more in bronchial wash and brush cytology compared to other types. Both bronchial wash and brush were positive in 14 cases and both were negative/inadequate in 20 cases. Number of cases with inadequate samples or negative for malignant cells were more in bronchial wash compared to bronchial brush. p value was 0.0001 when correlation was done between endoscopic biopsy and bronchial brush.

In 43 cases, CT guided FNAC results were compared with histopathology of CT guided biopsies. Most common type diagnosed by FNAC was adenocarcinoma. Out of the 43 cases 10 samples were inadequate or negative. The p value for the correlation between CT guided biopsy and FNAC was 0.036.

Table 1. Different types of lung carcinomas diagnosed by biopsy.

Histopathology type		frequency
Adenocarcinoma	43	44.3
Squamous cell carcinoma	23	23.7
Small cell carcinoma	19	19.6
Non-small cell carcinoma	5	5.2
Atypical cell/suspicious/poorly differentiated	2	2.1
Metastatic	4	4.1
anaplastic	1	1
Total	97	100

Table 2. Types of carcinomas diagnosed by bronchial brush.

Brush cytology	frequency	percentage
Adenocarcinoma	6	11.1
Squamous cell carcinoma	7	13
Small cell	6	11.1
Nonsmallcell/poorly differentiated.	5	9.3
Atypical/suspicious cells	9	16.7
Inadequate//negative	21	38.9
Metastasis	0	0
Total	54	100

Table 3. different types of carcinomas diagnosed by bronchial wash.

Bronchial wash	Frequency	Percent
Squamous	2	3.7
Non small cell/poorly differentiated	1	1.9
Atypical/suspicious cells	11	20.4
Inadequate/negative	40	74.1
Total	54	100.0

Table 4.

FNAC	Frequency	Percent
Adenocarcinoma	10	23.8
Squamous cell carcinoma	3	6.97
Small cell carcinoma	3	7.1
Non small cell/poorly differentiated carcinoma	10	23.8
Atypical/suspicious cells	6	14.3
Inadequate/negative	10	23.8
Metastasis	1	2.4
Total	43	100.0

Discussion

Majority of lung cancers are detected at a late stage (7). Timely detection plays an important role in the management and for the long term survival of the patients. Cytology is considered as an effective diagnostic tool for this condition. Though it is inferior to bronchial biopsy in typing, it is quite safe, less invasive, economical & provide quick results as compared to bronchial biopsy (8,9). Mak et al found that combination of brushings and washings had a high additional sensitivity in visible tumors (10). They concluded that for the maximum diagnostic yield for the diagnosis of cancer, biopsy should be combined with cytology using both washings and brushings. In our study we compared the bronchial wash and brush study with the biopsy. Majority of the patients were between 61-80 years range. There was male preponderance in our study. The male female ratio was 3.04:1. The percentage of male patients was a little higher in our study than in three recent studies which showed 71.1%, (11) 78.9% (12), and 80.6% (13), respectively. In our series lung tumors were located more on the right side than on the left. In our study bronchial washing could detect malignancy in only 14 out of 54 cases. 33 cases were diagnosed as malignant by bronchial brushing. This result is similar with that of Mak et al (10) and Chen et al studies (14). Most common histological type was adenocarcinoma. It is similar with the results of Shrestha MK (15). In our study significant p value was obtained in the comparison of endoscopic biopsy with bronchial brushings as well as in the comparison of CT guided biopsy with FNAC.

CONCLUSION.

Lung cancers are usually detected at an advanced stage.

Cytological methods like bronchial wash and bronchial brush might help in early detection of cancer in a more economical way.

In our study we have proved that combined analysis of brush and wash cytology improves the diagnostic rate.

Core biopsy in lung malignancy is also an invaluable aid because of its diagnostic accuracy.

REFERENCES

1. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. *CA Cancer J Clin* 2005;55:74-108.
2. Juan Rosai. *Surgical Pathology*: 8th edition, 1995:372-3.
3. Shure D. Radiologically occult endobronchial obstruction in bronchogenic carcinoma. *Amer J Med*. 1991;91:19-22.
4. Guidelines of the Papanicolaou Society of Cytopathology for the examination of cytologic specimens obtained from the respiratory tract. Papanicolaou Society of Cytopathology Task Force on Standards of Practice. *Diagn Cytopathol* 1999;21:61-9.
5. Schreiber G, McCrory DC. Performance characteristics of different modalities for diagnosis of suspected lung cancer: *Chest* 2003;123:115S-28.10.
6. Gaur DS, Thapliyal NC, Kishore S, Pathak VP. Efficacy of broncho-alveolar lavage and bronchial brush cytology in diagnosing lung cancers. *J Cytol* 2007;24:73-7.
7. Sayami G, Sayami P. Bronchial brushing cytology in suspected lung cancer. *JNMA*. 1993;31:132-7.
8. Gaber KA. Cytologic examination of whole endobronchial brush in bronchoscopic diagnosis of lung cancer. *Respiratory Medicine*. 2002;96(4):259-61.
9. Thomas LP. Sputum cytology for early diagnosis of lung cancer. *Current Opinion in Pulmonary Medicine*. 2003;19(40):309-12.
10. Mak VHF, Johnston IDA, Hetzel MR, Grubb C. Value of washings and brushings at fiberoptic bronchoscopy in the diagnosis of lung cancer. *Thorax* 1990;45:373-6.
11. Tan KB, Thamboo TP, Wang SC, Nilsson B, Rajwanshi A, Salto-Tellez M. Audit of transthoracic fine needle aspiration of the lung: Cytological sub classification of bronchogenic carcinomas and diagnosis of tuberculosis. *Singapore Med J* 2002;43:570-5.
12. Saha A, Kumar K, Choudhuri MK. Computed tomography-guided fine needle aspiration cytology of thoracic mass lesions: A study of 57 cases. *J Cytol* 2009;26:55-9.
13. Bandyopadhyay A, Laha R, Das TK, Sen S, Mangal S, Mitra PK. CT guided fine needle aspiration cytology of thoracic mass lesions: A prospective study of immediate cytological evaluation. *Indian J Pathol Microbiol* 2007;50:51-5.
14. Chen WT, Chao TY, Wu CP, Perng WC, Shen CY, Chiang CH. Comparison of the diagnostic yield of bronchial brushing cytology before and after endobronchial biopsy of flexible fibroptic bronchoscopy — A prospective study. *J Med Sci* 1997;18:165-70.
15. Shrestha MK, Ghartimagar D, Ghosh A. Computed tomogram guided fine needle aspiration cytology of lung and mediastinal masses with cytological correlation: A study of 257 cases in Western region of Nepal. *Nepal Med Coll J* 2014; 16(1): 80-83.