ORIGINAL ARTICLE:

THE FREQUENCY OF LUNG CANCER IN THE TISSUE SPECIMEN AT HISTOPATHOLOGICAL LABORATORY OBTAINED THROUGH FIBEROPTIC BRONCHOSCOPE.

Saadia Ashraf* Mukhtiar Zaman*, Nizam ud Din**.

Objective: To find out the diagnostic yield and frequency of lung cancer and its histological types in the tissue specimen taken through Fiber optic Bronchoscope.

Methodology: All bronchoscopic biopsy specimens received from Jan 2003 to Dec 2005 at a renowned City Laboratory Peshawar for histopathological examination were included in the analysis. The data regarding age, sex, presence or absence of tissue in the specimen bottle and histopathological diagnosis was recorded. The specimens were examined by one histopathologist.

Results: Total of 451 bronchoscopic biopsy specimens were received for histopathological analysis from hospitals and private clinics. There were 305 males (M) and 146 females (F) in the study sample with a mean age of 59 years. Twenty eight samples did not have sufficient tissue and were excluded from the analysis. Twenty four specimens were reported normal and 399 specimens has revealed pathology; 181 suggestive of malignancies, 173 were reported as chronic non- specific inflammation, 36 were reported as chronic granulomatous inflammation, 2 were reported as fungal infections, 2 fibrosis, 2 anthracosis, 1 aneurysm, 1 bronchial carcinoid and 1 focal metaplasia. In the 181 specimens suggestive of malignancy; 61 were squamous cell, 61 adenocarcinoma, 31 small cell, 4 large cell, 2 bronchoalveolar, 13 undifferentiated bronchial carcinoma, 1 Non- Hodgkin lymphoma and 8 others.

Conclusion: Laboratory based diagnostic yield of the bronchoscopic bronchial biopsies is 88% and malignancy (45.4%) is the most frequent diagnosis in this study sample.

INTRODUCTION:

Flexible Bronchoscopy is a minimally invasive procedure, which is commonly performed in clinical respiratory practice for various indications. The diagnostic yield of Bronchoscopy is regarded high; however it varies considerably depending on indication and techniques used during bronchoscopy.[1-4]

Literature Search has revealed that bronchoscopic diagnostic yield was evaluated collectively that is all the procedures performed during Bronchoscopic procedures yield in the obtained specimens, ranges from 48-85% in different studies[5]. Apart from other parameters affecting the diagnostic yield, processing of bronchoscopy. The tissue specimens and histopathologist expertise also needs to be considered and may be responsible for variable range of diagnostic yield[6].

** Pulmonology Department. Khyber Teaching Hospital. Peshawar KPK.*
*** Histopathologist City Laboratory Peshawar, KPK*

Methodology: All bronchoscopic biopsy specimens received from Jan 03 to Dec 05 at a renowned City Laboratory Peshawar for histopathological examination were included in the analysis. The data regarding age, sex, presence or absence of tissue in the specimen bottle and histopathological diagnosis was recorded. The specimens were examined by one histopathologist.

Results: Total of 451 bronchoscopic biopsy specimens were received for histopathological analysis from hospitals and private clinics. There were 305 males (M) and 146 females (F) in the study sample with a mean age of 59 years. Twenty eight samples did not have sufficient tissue and were excluded from the analysis. Twenty four specimens were reported normal and 399 specimens has revealed pathology; 181 suggestive of malignancies, 173 were reported as chronic non- specific inflammation, 36 were reported as chronic granulomatous inflammation, 2 were reported as fungal infections, 2 fibrosis, 2 anthracosis, 1 aneurysm, 1 bronchial carcinoid and 1 focal metaplasia. In the 181 specimens suggestive of malignancy; 61 were squamous cell, 61 adenocarcinoma, 31 small cell, 4 large cell, 2 bronchoalveolar, 13 undifferentiated bronchial carcinoma, 1 Non- Hodgkin lymphoma and 8 others.

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* Pulmonology Department. Khyber Teaching Hospital. Peshawar KP.

**Dr. Nizam ud Din Histopatholgist City Laboratory Peshawar, KP

INTRODUCTION:

Flexible bronchoscopy is a minimally invasive procedure, which is commonly performed in clinical respiratory practice for various indications. The diagnostic yield of bronchoscopy is regarded high; however it varies considerably depending on indication and techniques used during bronchoscopy.[1-4] Literature Search has revealed that bronchoscopic diagnostic yield was evaluated collectively that is all the procedures performed during bronchoscopy.

Bronchoscopic all procedures yield in the obtained specimens, ranges from 48-85% in different studies[5]. Apart from other parameters affecting the diagnostic yield, processing of the tissue specimens and histopathologist expertise also needs to be considered and may be responsible for variable range of diagnostic yield[6]. We conducted this study with the view to determine all diagnoses yield and frequency of lung cancer among the diagnoses in the tissue specimens obtained via flexible bronchoscope and processed in one single laboratory examined by single expert histopathologist who has the expertise of dealing with lung specimens.

PATIENTS AND METHODS:

All bronchoscopic biopsy specimens received for histopathological analysis from Jan 03 to Dec 05 at a local reference laboratory were analyzed. The specimens were processed by the standard technique and then examined by one histopathologist. The data regarding source of the specimen whether from teaching hospital or private clinic, age , sex, presence or absence of tissue in the specimen bottle, normal or abnormal findings and final histopathological diagnoses was recorded. Data was then entered and analyzed using SPSS version 14. All the bronchoscopies were done for an undiagnosed suspicious shadow on the chest x-ray.

RESULTS:

Total of 451 bronchoscopic biopsy specimens were received for histopathological analysis from hospitals and private clinics. There were 305 males (68%) and 146 females (32%) in the study sample with a mean age of 59 years. Data revealed that 207 (46%) and 244 (54%) specimens were received from public and private sector respectively. Twenty eight samples(6%) did not have sufficient tissue and were excluded from the analysis. However, source of inadequate samples analysis revealed no difference in percentage of specimens received from public and private sector that is 13/207 (6%) and 15/244 (6%) respectively. Twenty four (5%) specimens were reported normal and 399 (88%) specimens revealed pathology. Table I has shown the distribution of abnormalities as detected on histopathological examination. Malignancy was found in 181 (46%) of the specimens and 36 (9%) were reported as chronic granulomatous inflammation, others 5(1%) including 2 anthracosis, 1 aneurysm, 1 bronchial carcinoid and 1 focal metaplasia. Excluding chronic non- specific inflammation, the all diagnoses yield is 57%. In the 181 specimens suggestive of malignancy ; 137(76%) were male whereas 44(24%) were females; histological types of malignancy detected is given in table II; Squamous cell and Adenocarcinoma are the commonest histological types among the malignancies, each equal to 61(34%).

Table I : Distribution of Abnormalities Detected

SNO	Pathology detected	Number N= 399(percentage)
1.	Malignancy	181 (46)

2.	Chronic non- specific inflammation	173 (44)
3.	Chronic granulomatous inflammation	36 (9)
4.	Fungal	2 (0.5)
5.	Fibrosis	2 (0.5)
6.	Others	5 (1)

Table II : Distribution of Histological Types of Malignancy Found

SNo.	Histological Types	Number N= 181 (%age)
1.	Squamous Cell Carcinoma	61 (34)
2.	Adenocarcinoma	61 (34)
3.	Small Cell Carcinoma	31 (17)
4.	Undifferentiated Carcinoma	13 (7)
5.	Large Cell Carcinoma	4 (2.1)
6.	Broncho-alveolar Carcinoma	2 (1)
7.	Hodgkin`s lymphoma	1 (0.5)
8.	Others	8 (4.2)

Table: III Age categories, gender and type of Carcinoma distribution.

Age categories (yrs)	Squamous Cell Carcinoma		Adenocarcinoma		Small Cell Carcinoma		Ch. Granuloatous Inflammation	
	Male	Female	Male	Female	Male	Female	Male	Female
16- 30	0	2	1	1	4	0	0	1
31-45	2	0	9	3	3	1	1	4
46-60	23	6	15	15	4	1	6	6
61-75	24	0	10	2	13	2	5	11
> 75	4	0	4	1	3	0	2	0
	53	8	39	22	27	4	14	22

Table: IV Age and Gender distribution in Chronic granulomatous inflammation.

SNO	Age Categories	Chronic Granulomatous Inflammation		Total
		Male	Female	
1.	16-30	0	1	1
2.	31-45	1	4	5
3.	46-60	6	6	12
4.	61- 75	5	11	16
5.	> 75	2	0	2
		14	22	36

DISCUSSION:

Flexible bronchoscopy is a useful diagnostic tool in evaluation of undiagnosed chest symptoms and unresolving chest X-ray shadows. Adequate biopsy specimens depend on many factors, such as size, location and visibility of the lesion on the one hand and the expertise of the bronchoscopist, pathologist and the appropriate, effective bronchoscope with appropriate accessories on the other hand[1,2,6,7]. In our study, though there is 46% samples are from public sector and 54% from private sector but only 6% samples were inadequate from both setups. As our study is a laboratory based and we could not analyse most of the factors responsible for inadequate samples such as size and exact site of biopsy but still keeping in view the knowledge of lack of video bronchoscope in most of the setups and also inadequate operational circumstances it is encouraging to see only 6% inadequate samples.

In our study if we exclude chronic non-specific inflammation as a definite diagnosis, all diagnoses yield via biopsy specimen histological analysis was 57% . Boonsarngsuk V and colleague reported overall yield as 55%[8]. Extensive literature search did not reveal lab based diagnostic yield of bronchial biopsy study, though the diagnostic yield of malignancy found to be 45- 67%[8,9,10,11] in the national and international studies respectively. These figures are comparable to our study that is 46% of the specimens revealing malignancy.

In our study 36 (9%) of the specimen analysis confirmed chronic granulomatous inflammation and thus help in making diagnosis. In different studies, the frequency of granulomatous inflammation comes to be 8- 27%[11-13] .Keeping in view these results it is advisable to biopsy any undiagnosed suspected shadow on Chest X-ray even it is highly suspicious of malignancy as it might proved to be a treatable disease. The less number of granulomatous biopsies in a high prevalent country such as Pakistan may will be that majority of patients are either diagnosed through sputum microscopy or based on the x-ray findings.

Lung cancer is the most frequently diagnosed “major” cancer in the world with 1.3 million new cases diagnosed every year.Identification of the specific cell type in primary lung cancer is important because it is related to prognosis and response to therapy[15,16]. Christopher & colleagues showed that 67% were correctly diagnosed as malignancy via bronchial biopsy whereas identification of histological type was correctly diagnosed in cases of squamous cell >95% and Adenocarcinoma in 55% of cases. In our study squamous cell and adenocarcinoma are most frequently occurring malignancies each equal to 60%. Though in the literature we see that squamous cell carcinoma incidence is decreasing worldwide and there is increase trend in adenocarcinoma, both in males and females[17-19]but as our study is laboratory based and we need to conduct some prospective study with robust design to further get scientific evidence on this observation of changing trend in histological type of lung carcinoma in our setup.

Specimens revealing chronic non specific inflammation is 44% i.e. second commonly observed pathology. Such a pathology is not found in extensive literature search except a local study by Manzoor who reported 10% diagnostic yield as chronic non- specific inflammation[20] & this is probably due to the fact that our study is a laboratory based and we donot have a follow-up data of these patients or results of repeat biopsy if done. It would be interesting to follow and find the outcome of these patients and identify factors for this histopathological yield.

There are some limitations of this study as the data is purely laboratory based, being send by many clinicians of variable experiences and for varied indications and radiological findings. No follow up data of all the groups but especially of the non specific inflammation is available

CONCLUSION:

Laboratory based diagnostic yield of the bronchoscopic bronchial biopsies is 88% and malignancy (45.4%) is the most frequent diagnosis in this study sample.
In a country like Pakistan, where any lesion on Chest X-ray is very falsely labeled and treated as Tuberculosis without any confirmation, it seems wiser to subject them to bronchial biopsy and get a definite diagnosis and treat the patient full heartedly without any doubts.

REFERENCES:

1. Mak VH, Johnston ID, Hetzel MR, Grubb C. Value of washings and brushings at fibreoptic bronchoscopy in the diagnosis of lung cancer. Thorax 1990;45:373–6.
2. Gellert AR, Rudd RM, Sinha G, Geddes DM. Fibreoptic bronchoscopy: effect of multiple bronchial biopsies on diagnostic yield in bronchial carcinoma. Thorax 1982;37:684–7.
3. Descombes E, Gardiol D, Leuenberger P. Transbronchial lung biopsy: an analysis of 530 cases with reference to the number of samples. Monaldi Arch Chest Dis 1997;52:324–9.
4. The diagnosis, assessment and treatment of diffuse parenchymal lung disease in adults. Thorax 1999;54 Suppl 1:S1–14.
5. Richard S.Fraser, Neil Colman, Nester L. Muller, Pulmonary Neoplasms. Synopsis of the Diseases of the Chest. 3rd Edition.2005, Chapter 7; 338-345.
6. M. Noppen. Bronchoscopy in Daily Practice:Back toBasics.Editorial. Respiration 2001;68:564–565.
7. Travis WD, Travis LB, Devesa SS. Lung cancer .Department of Pulmonary and Mediastinal Pathology, Armed Forces Institute of Pathology, Washington, DC 20306-6000. Cancer. 1995 Jan 1;75(1 Suppl):191-202. Erratum in: Cancer 1995 Jun 15;75(12):2979.
8. Boonsarngsuk V, Raweelert P, Sukprapruet A, Chaiprasithikul R, Kiatboonsri S Factors affecting the diagnostic yield of flexible bronchoscopy without guidance in pulmonary nodules or masses. Singapore Med J. 2010 Aug;51(8):660-5.
9. Yaacob I, Harun Z, Ahmad Z. Fibreoptic bronchoscopy--a Malaysian experience. Singapore Med J. 1991 Feb;32(1):26-8.
10. Taha AS. Flexible fibreoptic bronchoscopy in Basra, Iraq: a 20-month experience. East Mediterr Health J. 2000 Mar-May;6(2-3):226-32.
11. Nadeem Rizvi, M Husain, S Sarwat Hassan, Zakaullah Beg. An Audit of 191 Fiberoptic Bronchoscopies. J Coll Physicians Surg Pak. Apr 1997;7(2):64-6.
12. Nisar Ahmed Rao, Syed Saleem Hasan. Usefulness of fibreoptic Bronchoscopy in hospital practice. Pak J Chest Med. Jan - Mar 2006;12(1):17-20.
13. Mir Azam Khan, Muhammad Attaur Rahman Adnan, Afaq Khattak,et al. Frequency of lung cancer diagnosed bronchoscopically in a tertiary care chest facility**.**J Postgrad Med Inst Oct - Dec 2011;25(4):338-42.
14. Ladina Joos, Nicola Patuto, Prashant N. Chhajed, Michael Tamm. Diagnostic yield of flexible bronchoscopy in current clinical practice . Swiss med wkly 2006;136:155–159.

15. Lam B, Wong MP, Ooi C, Lam WK, Chan KN, Ho JC, Tsang KW.Diagnostic yield of bronchoscopic sampling methods in bronchial carcinoma. Respirology. 2000 Sep;5(3):265-70.
16. Chuang MT, Marchevsky A, Teirstein AS, et al. Diagnosis of lung cancer by fiberoptic bronchoscopy: problems in the histological classification of non-small cell carcinoma. Thorax 1984; 39: 175- 78.
17. Vysamiae AI, Kiung VA. The morphology of lung cancer and background changes according to bronchoscopic biopsy findings. Arkh Patol. 1975;37(9):49-54.
18. Rudd RM, Gellert AR, Boldy D, et al. Bronchoscopic and percutaneous
aspiration biopsy in the diagnosis of bronchial carcinoma cell type. Thorax 1982; 37: 462-65.
19. Cataluna JJS, Perpina M, Greses JV, et al.Cell type accuracy of bronchial biopsy specimens in primary lung cancer. Chest 1996; 109: 1199-203.
20. Mazhar M, Jehanzeb A. Fibreoptic bronchoscopy;Diagnostic outcome and complications in Patients with hilar and parahilar lung Opacities. Professional Med J Sep 2006; 13(3):384-90.